

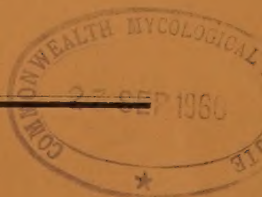
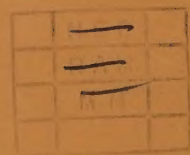


TANGANYIKA

MINISTRY OF NATURAL RESOURCES

Annual Report
of the
Department of Agriculture
1959
PART I

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PART I

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TANGANYIKA

ANNUAL REPORT OF THE DEPARTMENT OF AGRICULTURE, 1959

Part I

SECTION I

INTRODUCTION

Agricultural production continued to increase in 1959, and although the prices of some primary commodities had fallen appreciably, the total value of agricultural exports from the Territory was maintained. This was a big achievement in which many organizations and individuals played an important part and augurs well for the future.

Steady progress was made in re-establishing good relations with the farmers in the Lake Province and in other places where for political reasons relations had deteriorated. Assistance from the Department was eagerly sought in most areas of the Territory, and, as a result, substantial advances were made by the extension service in introducing improved methods of cultivation and processing of the main crops. Good progress was also made in the majority of the Increased Productivity Schemes, on which work was begun in 1958.

The laboratories and most of the housing for the four Regional Research Centres of the Department were completed. The specialist officers are continuing the investigations already begun and have expanded their programmes to include experiments recommended by the Regional Research Committees. These committees consist of the more senior officers associated with the Region on the research and extension divisions of the Department. Their function is to review the past year's work of the centre and to discuss and make suggestions for future work.

Training of staff was revised and considerably intensified during the year. Arrangements were made for the training of local staff to fill some of the more senior positions.

The Machinery Testing Unit of the Department was transferred from Malva to Tengeru to allow closer contact with the East African Tractor and Implement Testing Unit which has its headquarters in Kenya. The work of the Mechanical Services has been reduced and more closely integrated with the Farms and Estates planning section.

Investigations into the problems associated with irrigation were continued and some of the problems were solved.

SECTION II

WEATHER CONDITIONS

The total rainfall for the 1958/59 season and for the year 1959 was below normal in most areas. (Appendix I). The rains were late in starting and early in finishing, both in the north and coastal areas which have normally two rainy seasons and the rest of the country which normally has one.

In general, the rains were just sufficient for the growth of crops and good harvests were obtained except in a few districts, e.g. Nzega, where food shortage was experienced.

SECTION III

MAIN CROPS

Figures for the production of crops or amounts marketed are given in Appendix II and exports from Tanganyika in Appendix III. The figures should be read with caution since many crops are either consumed or processed locally and the proportion of crops

passing through regular and recorded markets has again fallen during 1959. The reason for this is that the marketing of produce through Native Authority markets is no longer so popular as it was, either with the grower or the buyer. The grower prefers to avoid payment of cesses and duties which are imposed on produce sold through markets and, with increasing competition, the buyer now finds it profitable to give better service to the grower and to collect his produce almost from the doorstep.

Sisal

Sisal remains the most important export crop, though cotton and coffee are running it more closely than they did in the past. 205,273 tons of fibre were produced compared with 196,567 tons in 1958. The reasons for this increase were improved cultural methods, greater use of fertilizer and lime and favourable weather. Prices improved from 1958, the best price for No. 1 was £100 per ton and the average price per ton over the year was £63 f.o.b. as compared with £52 in 1958. The total value of exported sisal (208,767 tons) was £13,057,043 compared with £10,348,965 in 1958.

From the agricultural viewpoint, the most important event was the official release of the hybrid No. 11648 from the Sisal Research Station at Mlingano. This hybrid is capable of producing, under good conditions, three times the existing normal yield of fibre per acre. Estate owners are considering planting the hybrid on the best parts of their land and converting the remaining areas to other crops such as coconuts, cashew, and papaw or to cattle grazing. The Sisal Research Station staff is investigating the crops to be grown and the problems resulting from the change to the hybrid.

A leaf scorch condition, which appeared on young sisal in parts of the Eastern Province, was found to result from the high humidity and hot sun which followed the heavy rains in August. Leaf scorch was severe in the Mtwara-Mikindani area in December.

The increase in the sisal price resulted in the revival of the hedge sisal industry in the Lake Province, which had been dormant for some years. The price for hand-decorticated sisal reached 80 cents per kilo, but towards the end of the year it had dropped to about 60 cents per kilo. 3,148 tons were sold by the end of the year.

Coffee

Coffee has been surpassed by cotton in export value and is now in third place among the important cash crops. The harvest was a fairly good one for Arabica and the crop was increased by the production of several new and developing areas. There was a slight drop in Robusta production.

The total export of coffee was 19,607 tons valued at £5,745,438 as compared with 22,225 tons valued at £7,578,725 in 1958.

The problem of world over-production of coffee has exercised the minds of those involved in the coffee industry in Tanganyika during 1959. Towards the end of the year the Government entered into an agreement to restrict exports of coffee to traditional markets for a period of one year in the first place, during which time it was hoped that the International Coffee Study Group in Washington would be able to draw up definite proposals for a long-term solution to the problem of surpluses. Tanganyika is placing increasing emphasis on improving the quality of mild coffee which, it is hoped, will be able to compete on the world markets better than lower quality hard coffees.

(a) Mild Coffee

The 1959 mild coffee crop was larger than ever in almost all areas of the Territory. The main reason for this increase is the production from new areas, particularly in the Southern Highlands, Southern, Tanga and Western Provinces, although the African grown crop in Arusha also increased by one-third over that of 1958. The total crop marketed was 14,713 tons compared with 12,083 in 1958. Almost 2,000,000 seedlings were distributed from Departmental, Native Authority and Co-operative coffee nurseries during the year. Considering the number of coffee seedlings which have been issued over the past few years,

particularly in the Kilimanjaro area, the results in increased production have been disappointing, due to inadequate care of the seedlings and young trees, but this care is gradually improving.

Growers in many areas are paying greater attention to mulching. The use of irrigation is on the increase in both the Northern and the Southern Highlands Provinces and this has resulted in big increases in yields.

With falling prices and over-production of coffee in the world at large, the necessity to improve quality has become urgent. One step which should assist the encouragement of quality production is the decision of the Kilimanjaro Native Co-operative Union to sell a high proportion of their coffee under society marks. With production based on these smaller units, it is expected that there will be more chance of improving the out-turn of those societies which are willing to help themselves and the improvement in the price paid to the growers who produce better quality should thereby become more apparent. More individually owned and communal pulperies have been constructed in the Northern Province and this will lead to improvement in quality.

In the smaller coffee growing areas in the Eastern, Western, Tanga and Southern Provinces, several small hand pulpers and individual factories have been constructed during the year, and these will contribute to an improvement in quality. At Mbozi, where African produced coffee has hitherto always been of the poorest quality, combined efforts of the Department and growers have resulted in a considerable improvement. The quality of non-African coffee has been extremely good at Mbozi.

In the Northern Province there was a severe attack of Coffee Berry Moth this year. Spraying campaigns against *Antestia* in all coffee areas were continued, and action against the White Stem Borer (*Anthores*) using Dieldrin has continued, and is now beginning to show results.

(b) *Hard Coffee*

Total production figures are 9,356 tons of clean coffee compared with 9,742 tons in 1958. The average price of Robusta F.A.Q. was £141 per ton at Bukoba. Features of the production are the slight reduction in West Lake (9,494 tons in 1958 and 8,948 tons in 1959), the record crop of over 320 tons from Ngara and the successful development of the North Mara crop.

There is great variation in the standards of coffee husbandry. In Bukoba 900,000 seedlings were distributed but many were wasted due to lack of care. In North Mara, great care was taken of the young trees and they produced the equivalent of 988 lb. of clean coffee per acre, in their first year of bearing. Mulching is slowly becoming accepted practice. Pruning is improving as a result of the work of the departmental pruning teams. Preparation for market is good in Ngara and North Mara but could be much improved in Bukoba. The Coffee Grader in Bukoba made a classification of defective beans—41 per cent were insect damaged, 20 per cent were defective due to faulty picking or drying and 39 per cent were mechanically damaged or unhulled.

The Bukoba Native Co-operative Union has continued its policy of producing the maximum quantity of F.A.Q. coffee, and their bulking plant, installed in 1958, worked satisfactorily throughout the year.

In North Mara 10 tons of dried cherry were sold and a very favourable report was received on its quality. It is proposed to market the crop co-operatively and to open a small factory for the production of mild coffee when the size of the crop warrants.

Experiments were made in Bukoba to determine whether pulping was economic. The indications are that although pulping may raise the price of Arabica sufficiently to cover the cost, this is not so of Robusta.

Pests did severe damage in the hard coffee areas. *Stephanoderes* work was confined to observations on the results of spraying and testing of techniques prior to a large-scale campaign in 1960. Spraying against White Stem Borer in West Lake was successful, but spraying against *Antestia* in Ngara did not control the pest as well as it should and seemed to be responsible for the outbreak of Lace-Wing Bug.

Cotton

Cotton has now become the second most important cash crop in the Territory. The season was favourable and a record crop of 201,093 bales of lint was achieved compared with 171,433 bales in 1958. Over 182,000 bales came from Lake Province. This exceeded the previous Lake Province record by 30,000 bales. The estimated values of exports of lint, seed, seed cake and oil in 1959 were as follows:—

	£
Lint	7,500,000
Seed	1,000,000
Seed cake	500,000
Oil	500,000
Total	£9,500,000

The principal contributing factors to the increased production in Lake Province were more growers planting greater acreages and earlier planting.

Agreement was reached with the Director of Agriculture, Uganda, regarding the Bukoba crop. This area previously followed the Uganda planting season, used Uganda seed and marketed the crop in Uganda. From 1960 however, this area will follow the Lake Region planting season, use Lake Region seed and market the crop there.

There was a decrease in production in the Eastern Province brought about largely by a fall in production in the Rufiji and Ulanga areas. These areas are planted on alluvial soils of the Kilombero and Rufiji river basins, and seed is sown when the floods from these rivers recede. No floods occurred in the 1959 season, with the result that very little cotton was planted.

Large areas of the Tanga Province were affected by drought. In spite of this, however, the crop was greater than last year, due chiefly to a considerably increased acreage of early planted cotton.

Production in the Northern Province was much the same as last year although more seed was distributed than in 1958. Poor rain in the lower areas and shortage of water for irrigation were the main causes of reduced yields.

In most areas cultivation of the crop is gradually improving. Picking, however, was not well done and some of the crop was left too long on the plant, resulting in loss of bloom. In general the quality of cotton was good.

Grading in the Eastern Province is satisfactory, but some of the Co-operatives in Lake Province are allowing some stained cotton to pass as A Grade, giving the cotton a poor appearance.

Every endeavour was made to reduce the amount of jute string or other fibre which finds its way into the cotton at ginneries. The problem will be partially solved by the introduction of legislation in the Lake Region forbidding growers to sell their cotton at primary markets in anything other than squares of cotton cloth. Progress is also being made towards eliminating the introduction of foreign matter (chiefly jute string) in the transport of seed cotton from primary markets to the ginnery. Buyers are being encouraged to use large, closely woven canvas bags with draw-strings of cotton twine. In 1958 one Co-operative Union used such bags and in 1959 two. In 1960 however, eight Unions will probably use these bags and it is hoped that eventually all Unions may be persuaded to transport their cotton from buying posts in this manner.

For the first time in the history of cotton buying in the Lake Province, Co-operatives bought all the seed-cotton. They first started buying in 1953 and have built up an organization capable of running the whole of this part of the industry. They also undertook the transport of seed cotton in four ginnery zones out of the fourteen operating in 1959, and will probably extend these activities in 1960.

The price of Grade A seed cotton to the grower was 52 cents per lb. (2 cents lower than last year) and Grade C seed cotton remained the same as last year at 20 cents per lb. From this price there are deductions for Native Authority cess, Co-operative dues and, in Coastal Provinces, transport charges.

Several ginneries installed improved machinery and devices to reduce the labour required at the ginneries. A new ginnery at Same is nearing completion. The Victoria Federation have commenced building four new ginneries, which will be ready to handle the anticipated increase in crop in 1960. At Shinyanga a ginnery with the most up-to-date equipment has been built to replace one which was destroyed by fire.

Pests and diseases were not severe in Lake Province. All the seed was treated against Bacterial Blight.

Tests in the Lake Province have shown that mercurial dusts are more efficient fungicides and are more economical than the cuprous dusts already in use for treating cotton seed against Bacterial Blight. Further tests are being carried out to find whether these dusts can be used safely by the workers at the dusting machines.

At the end of the year, prospects were excellent for a heavy crop in 1960 in the Lake Region. Not only were considerably increased quantities of seed issued, but the seed was planted unusually early and the rains were good. In 1958, 7,965 tons of seed were distributed and in 1959, 10,260 tons.

An important development took place in 1959, which will have far-reaching effects on the future of the industry. At the beginning of the year the report on the Cotton Industry in Tanganyika compiled by Messrs. Cooper Bros. and Co., was published. Its terms of reference were:—

“to review the organization and economics of the cotton industry in Tanganyika, with specific reference to the cost of the services rendered by and the basis of remuneration of those engaged in the buying and ginning of cotton”.

The report has now been considered by Government and certain recommendations are to be implemented shortly.

The main change which will affect both the producer and the ginner, is the proposed new method of calculating the price paid to the grower. This will no longer be fixed by Government but will be the subject of negotiation between the Ginners Association and the Co-operative Societies representing the growers.

The Minister of Natural Resources, advised by the Lint and Seed Marketing Board (which will continue to purchase all cotton lint produced in the Territory) will, as in the past, decide and promulgate a lint price and this will be the basis of the negotiated price of seed cotton.

This means that Ginners will no longer work under a formula that provides for the reimbursement of costs plus a fixed profit.

In 1960 the new proposals will be put into effect in the Lake Region. In Northern and Coastal Provinces the recommendations will not come into effect until mid-1962.

Cashew Nuts

The crop this year was a good one, due to the fairly good rains on the Coast and the increased planting in recent years. 28,401 tons of nuts were marketed compared with 20,556 tons in 1958 and the total value to the grower was about £828,000. 24,100 tons of this production came from Southern Province.

Husbandry of the trees is improving slowly, as growers realize that this results in bigger crops and higher income. Many more trees are being planted in all producing districts.

In the Southern Province, the flowering was very heavy but the setting of fruit disappointing. In the Eastern Province mainland the crop was good, but on Mafia Island the crop was reduced by drought and fires.

Quality has improved as a result of persuasion and discriminative buying.

Prices were high. In the Southern Province the price rose from 50 cents per kilo in 1958 to as high as 60 cents per kilo in 1959. In Dar es Salaam the price reached 1/- per kilo.

Helopeltis and *Pseudotheraptus* reduced the crop and damaged the quality in parts of the coast.

Cassava and Sweet Potatoes

Approximately 17,760 tons of cassava were bought in the Southern Province mainly in Newala and this was worth over £150,000 to the growers. European markets now demand dried cassava roots rather than cassava flour, and five cassava mills in Mtwara have been badly hit by this change. Newala produces a high quality root which is well dried, white in colour, and free from mould.

Western Province marketed 6,180 tons of dried root, of which over 1,000 tons came from Kigoma.

Cassava is a valuable cash crop in areas adjacent to Dar es Salaam and increased acreages are being planted.

Two mosaic-resistant varieties, 46106/27 and 4763/16, which were distributed to focal points in Tanga Province in 1956, have done extremely well. There has been only 7 per cent breakdown to mosaic compared with almost 100 per cent susceptibility of the original local varieties. Variety 46106/27 is particularly popular and continues to spread rapidly.

Sweet potatoes are popular as a food crop throughout the Territory, and a valuable cash crop near the big centres of population. It is also a useful quick-growing crop to combat food shortages. The variety Caroline Lee, which was distributed in Tanga Province in 1956, is continuing to spread.

Coconuts, Copra and Coir

Coconut products have increased in value this year.

The main product is copra. The crop was a good one in most of the coastal areas. It is estimated that 11,606 tons were marketed, worth £905,268 (£78 per ton). This compares with 10,955 tons in 1958 worth £633,309. Quality remains poor as the trade does not give an adequate premium for clean, well-dried copra. This makes it uneconomic to dry the copra in kilns.

There was an increase in coir production. Two factories in Tanga manufacture coir, and the price for green husks is now 15/- per lorry load. The export price for coir fibre rose from £38 to £45 per ton during the year, and 920 tons were produced, as compared with 300 tons in 1958. The export of whole husked nuts to Europe has become a useful minor industry. The price in the field is Shs. 155/- per 1,000 nuts.

A little progress can be reported in the improvement of standards of cultivation and crop sanitation. Two estates on Mafia are outstanding for their use of fertilizers, green manure and controlled grazing of the plantations.

Maize, Sorghum and Millets

(a) Maize

The rain during the growing season was insufficient for maize in several areas but in general yields were fairly good. 70,154 tons were sold on the markets compared with 67,714 tons in 1958 and the income to the grower was about £982,150.

Prices varied from Shs. 24/- to Shs. 27/50 per bag in the main producing areas.

The crop in the Northern Province, which produces the largest amount in the Territory, varied considerably from one area to another, largely due to the vagaries of the weather. Total production was well down in 1959, and it is estimated that only 22,000 tons were marketed compared with 26,500 tons in 1958.

In the Southern Highlands Province, 1959 has been a fairly good maize year. The bulk of the surplus crop comes from the Iringa District, from which 10,000 tons were exported.

In Western Province 11,400 tons were marketed mainly from the Western Districts.

Other important producing areas are Eastern Province 4,000 tons, Southern Province 5,273 tons (mainly from Songea) and Lake Province 5,289 tons (mainly from North Mara)

(b) *Sorghum*

1959 was a good year for sorghum in all areas. In the Central Province, where it is the staple crop of the Wagogo, yields were high. The season was also a good one in the Eastern Province, where some 1,200 tons (more than twice last year's tonnage) were marketed. From the Wami-Magole area over 1,000 tons were sold, this being over five times the amount sold in the previous year. Prices ranged from Shs. 37/- to Shs. 45/- per bag. In the Southern Province the surplus crop was estimated to have totalled 3,200 tons and in the West Lake Province excellent harvests of both red and white varieties were secured, thereby ensuring a busy season for the brewers and beer consumers in the area.

(c) *Millet*s

Millet of various kinds are grown throughout the country for food and beer. Nearly all the harvest is consumed locally.

In North Mara District where finger millet is an important cash crop, the shortage of rain had a bad effect and it is estimated that 4,818 tons were sold. Similarly in Musoma the surplus crop was estimated to have been only 1,000 tons compared with 1,500 tons in 1958.

Oil Seeds

(a) *Castor*

A substantial fall in the price of castor had a depressing effect on production of the crop. The total amount marketed was 6,194 tons worth about £238,530 to the growers as compared with 6,973 tons in 1958 and 13,894 tons in 1957. In Dodoma and Mpwapwa the acreage fell only slightly, but in the other districts of the Province interest was much less. New plantings have been few, and the reliance on the ratooned crop, often mixed with cereals, has invited further pest attack, particularly of *Helopeltis*.

In most of the districts of the Eastern and Southern Provinces there was a sharp fall in production, but in the Southern Highlands Province production is estimated to have risen from 323 tons to 451 tons. Towards the end of the year prices rose from 30 cents per lb. to 32 cents per lb.

(b) *Groundnuts*

This was a good season for groundnuts and 15,927 tons were marketed as compared with 9,706 tons in 1958. The value of the crop to the grower was about £732,650.

In the Central and Western Provinces, where groundnuts are the chief cash crop, this has been a good season where early planting occurred. The price rose steadily throughout the season and this gave considerable satisfaction. A bigger crop than in 1958 is reported from the Southern and Southern Highlands Provinces. On the other hand, the Lake Province is estimated to have produced only half the exportable surplus it produced in 1958.

Efforts have been made to improve the quality of the crop, and standards have been set by the exporting firms in Dar es Salaam. The "Mambo Leo" varieties did well where the rain was inadequate for the "Dodoma bold" type, and in the Southern Province the "Mwitunde" variety has again done very well and has confirmed once again its rosette resistance.

(c) *Sesame*

The sesame crop was the best for many years and 10,160 tons were marketed, worth £508,000 to the growers. By far the biggest producer is the Southern Province where 8,673 tons were marketed. Considerable interest was aroused by the introduced variety "Morada" which is being bulked and distributed in Southern and Lake Provinces.

The flea beetle caused damage, despite some use of insecticides.

(d) *Sunflower*

The crop marketed was 4,735 tons compared with 8,847 tons in 1958. This was worth about £141,500 to the grower.

Sunflower is an excellent crop for many of the drier areas of Tanganyika, but unfortunately its price changes radically from year to year. The 1958 price was particularly low with the result that in 1959 there was a further substantial fall in production in almost every part of the Territory. On the other hand during the 1959 season the price has been higher, and there is therefore a possibility that the crop might revive slightly in 1960.

(e) *Mafura nut (Trichilia emetica)*

The Southern Highlands crop of these nuts which are rich in fatty oil, is estimated to have been 340 tons, compared with 196 tons in 1958. The crop was all purchased by a local soap factory in Tukuyu.

Paddy

The crop was above the average of the past five years, but there was a tremendous variation in crop yields from place to place. Where paddy was grown with the aid of irrigation it did well, but where it had to rely on rainfall it did badly. The total marketed crop of paddy was 30,362 tons, worth about £680,000 to the grower, as compared with 29,909 tons in 1958. The price of paddy fell to approximately 45 cents per kilo in most areas, and early in the season growers were reluctant to accept such a substantial reduction on last year's price, which had often been as high as 70 cents per kilo. In Rungwe and Rufiji paddy planting was completed in good time and germination was excellent, but by mid-April the extremely dry weather caused severe checks in growth, and the final production was comparatively low. On the other hand, good crops were harvested in Ulanga, Kilosa, Bagamoyo and Mbulu. The crop also did well in the Lake Tanganyika shore area and in the Usangu Plains of Mbeya.

A feature of the year was the bumper crop, estimated to have exceeded 6,000 tons, which was harvested in Tanga, Lushoto and Pare. The late onset of the rains gave adequate time for the preparation of an increased acreage. In the Kihurio and Mkomazi areas paddy benefited by the control of flash floods by the Kalimawe reservoir and the improved distribution of water by stick weirs between Mkomazi and Mombo.

Pulses

Pulses grown in Tanganyika, include black and green grams (*Phaseolus mungo* and *aureus*), haricot beans (*Phaseolus vulgaris*), bonavist beans (*Dolichos lablab*), soya beans (*Glycine max*), chick peas (*Cicer arietinum*), pigeon peas (*Cajanus indicus*), bambarra nuts (*Voandzeia subterranea*), cowpea (*Vigna sinensis*), and field peas (*Pisum sativum*). The season was reasonably good for these crops and it is estimated that 15,000 tons were marketed.

(a) Mixed Beans did well in most areas particularly in Mbulu, Njombe and Mbeya, but failed in some of the lower altitude areas from shortage of rain. They form an important part of the peasants' diet and are being encouraged.

(b) Soya Beans. Interest in this crop revived in Bukoba and Karagwe, where all the crop was bought for seed for next year, and in Nachingwea by the improved varieties being bred there.

(c) Field Peas form an important food and cash crop particularly in the Poroto Mountains and other parts of the Southern Highlands Province where 550 tons were marketed.

(d) Pigeon Pea is gaining in popularity notably in Arusha, Buha and the Southern Highlands Province.

(e) Chickpea. The early cessation of the rains and dissatisfaction with the price led to further reduction in the Lake Province crop. About 2,140 tons were marketed at 25 to 28 cents per lb.

(f) Bambarra Nuts are widespread but are of importance only in Bukoba as one of the few crops which produce a yield on the poor grassland soils.

(g) Cowpeas and Green grams gave fair to poor yields this year.

Pyrethrum

The total production of dried flowers was 346 tons from Southern Highlands Province and 483 tons from Northern Province. This was sold to the East African Extract Corporation and the grower received about Shs. 2/50 per lb. depending on the pyrethrin content which varied from 1.09 per cent to 1.23 per cent. Of the production 544 tons were exported, worth £113,528.

There was a most encouraging increase in pyrethrum production in both areas. The increase in the Southern Highlands from 249 tons to 346 tons was due to the vigorously expanding African pyrethrum industry. Estate production continued to decline due to estates changing to tea in Uwemba.

Interest among peasant growers has been aroused in Mbeya and Iringa, where estates are already in production.

In the Northern Province increased production has been achieved in both peasant holdings and estates, though shortage of rain and of viable seed caused some setbacks. Arrangements have been made for the temporary use of glades in the Monduli and Meru forest reserves for pyrethrum growing followed by tree planting. The standard of husbandry is improving and yields in the better areas exceed 1,000 lb. of dried flowers per acre.

Research is required into problems of husbandry and the fertilizers necessary for continued good yields, though superphosphate is known to be beneficial and many estate owners apply it. Thrips were prevalent in many areas. A leaf disease (*Colletotrichum*) and a bud disease (*Ramularia*) caused severe damage locally.

An Agricultural Officer has been posted to work on pyrethrum research.

Seed Beans and Seed Peas

1958/9 was an ideal year for seed production and the crop of 3,888 tons was a record. The value of this crop is about £380,000. Small areas are grown in the Central and Southern Highlands Provinces. Yields were affected by dry weather in some of the marginal areas, but in general, average yields were obtained. Plans have been made to introduce a seed certification scheme to cover all bean seed issued by registered growers to sub-contractors. This will be on a voluntary basis for the 1959/60 season, but it is intended to introduce rules to make certification compulsory in 1960/61. At the present stage this scheme will cover only germination, physical quality of the seed and freedom from *Anthraxnose*.

The participation of Africans in the growing of seed beans continues to increase, particularly in the Babati area where there are several large African growers. Boll worm again threatened the crop in some areas, and fields were sprayed from the air, which gave effective control. In general the crop was reasonably free from disease, and even "Halo Blight" was less in evidence. The condition "Oily Pod" mentioned in last year's report was recorded only on a limited number of plants on one estate.

The production of seed peas continues in West Kilimanjaro, but on a smaller scale than previously. Seed pea growing by Africans on contract was instituted by a farmer in Iringa. In spite of various difficulties, a crop of over 150 tons of seed peas was produced in the area. Yields were reduced slightly due to poor growing conditions, but the crop is of good quality. The potential for seed pea production in the Southern Highlands is almost unlimited, and it is intended that the industry be expanded as rapidly as possible in order to produce a minimum of 1,000 tons.

There has been an increased acreage of flower seeds, particularly Zinnias, produced in the Northern Province and on one estate in the Central Province, and small trials of other flower seeds have been made.

Sugar

The total production of white sugar is assessed at 27,641 tons, a big increase on 1958.

The main production of sugar comes from the Tanganyika Planting Company's plantation at Arusha Chini near Moshi. Some 7,000 acres are under cane on the estate and new areas are being cleared.

There was a further increase in the acreage planted to sugar on the plantation in Arusha District, where 1,500 acres are now under cane.

In Bukoba, the Bhagwant Plantation continued to clear new land and plant cane. There are now some 2,400 acres, of which 2,300 are mature. Cane yields are rather low because the estate lies in the 30 in. to 35 in. rainfall zone and the owners are now proposing to install an irrigation system. The Department has arranged for fertilizer trials on the estate. Production of white sugar from the new factory has been erratic, due to mechanical difficulties and shortage of water and labour, the maximum production in any one month being only 80 tons.

At Turiani in Morogoro District a sugar estate is being rapidly developed and a pilot factory has been constructed. Two farms at Sanje in the Kilombero area have continued to plant cane in the hope that a sugar factory will be built at Ruaha, but in the meantime jaggery is being produced. Jaggery is also being produced in Kilosa for sale to sisal estates, at the Turney Sugar Estate in Bukoba and in other areas.

Tea

The production of tea continues to expand in both the main growing areas, the Usambara Mountains and the Southern Highlands (Tukuyu and Mufindi). The total production of made tea was 8,154,534 lb., compared with 6,328,174 lb. in 1958. The total value of this production was just over £1,000,000.

In Tukuyu 1959 was an exceptionally good year, and production at 2,476,685 lb. of made tea was 610,980 lb. over 1958. A record quantity of 95,000 lb. of tea seed was sold for £29,000.

Mufindi's rainfall was below average, but production was 2,726,125 lb. of made tea compared with 2,256,540 lb. in the previous year.

Estates have been established at Lupembe and Uwemba in Njombe District, although neither of these areas is yet in production.

There has been a further expansion in the Usambara area and 2,951,724 lb. of made tea were produced in 1959. There are now five factories in the Eastern Usambaras, and four in the Western Usambaras. The introduction of the latest manufacturing machinery, including trough withering, C.T.C. (crush, tear and curl) and the Legg cutting process, is keeping pace with the expansion of the industry. The Tea Research Institute has now opened a sub-station at Amani under the supervision of a Field Officer.

Tobacco

Tobacco growers had a favourable season and crops were good. The production of flue-cured was 4,769,968 lb. worth about £610,000 to the growers, fire-cured 1,528,208 lb. worth about £76,400 plus an unknown quantity of coil. Turkish is still in the trial stage.

(a) Flue Cured Tobacco

In Iringa, the production of the "Ehlers" variety of tobacco was finally discontinued, and the entire crop was "Virginia". This significant change was brought about by the valuable work carried out at Seatondale Research Station, which is financed by the Southern Highlands Non-Native Tobacco Board, and managed by the Agricultural Department.

Climatic conditions in Iringa were fairly good for Virginia tobacco production but the standards of crop husbandry can be improved, though there are notable exceptions. Diseases were not a major problem, although rosette was fairly widespread. In the Ulete area some financial loss was again experienced due to hail damage. The Southern Highlands Non-Native Tobacco Board regulates the growing of the crop in the Southern Highlands Province. At Lupa Tingatinga, in Chunya, over 70,000 lb. of saleable leaf were produced compared with 37,500 lb. in 1958.

In the Western Province the main producers are the tenant farmers on the Tanganyika Agricultural Corporation area at Urambo who produced 1,077,000 lb. of Leaf. At Tumbi, where the East African Tobacco Company has a Leaf Centre and an experimental farm,



In the Mpwapwa District of Central Province, donkeys as well as oxen are being used for ploughing. In this photograph donkeys are seen under training for this work.



There has been considerable expansion of pyrethrum growing in the Southern Highlands Province in 1959. This photograph, which shows harvesting in progress, comes from Mbeya District.

a number of African farmers are now growing tobacco. These either grew green leaf or were "Master Growers" who produced flue cured tobacco. 87,000 lb. of green leaf and 5,600 lb. of flue-cured tobacco were marketed.

The total production of flue cured tobacco in the Western Province was 1,164,800 lb. equal to £177,750 an average of Shs. 3/04 per lb.

(b) Fire Cured Tobacco

Fire-cured tobacco production declined slightly from 1958 due to unfavourable weather in Songea and the high prices paid for coil in the Nyamirembe Tobacco Board area, south west of Lake Victoria. The Board and its agent bought 149 tons of leaf which was delivered by lorry to Kampala. The competition of the coil trade was very severe and it is planned to concentrate the leaf trade on the main easily accessible areas and leave the small outlying areas to satisfy the coil trade. The quality of the leaf was reduced by excessive moisture content.

The combined campaign by the District Team and the Tobacco Union in Songea to revive the flagging fire-cured tobacco industry has maintained the encouraging progress which was begun in 1958. A target of 700 tons was fixed at the beginning of the season, and would have been reached had the rains continued beyond the end of March. A total of 551 tons was produced compared with a total of 567 in 1958, and the quality was very good. The neighbouring Tunduru District, has made a start in producing fire-cured tobacco and some 70 growers produced 5 tons of good quality leaf.

(c) Coil Tobacco

There is a small production of coil tobacco in most districts for local consumption and trade. The amounts marketed are largely unknown but Kibondo produced about 300 tons, Southern Province 150—200 tons and Tanga Province 50 tons. Large prices are paid early in the season but the market is soon satisfied and prices fall heavily.

(d) Turkish Tobacco

Following reports in 1958 that there was a growing market for Turkish tobacco in the Americas, preliminary trials which indicated that Turkish tobacco can be grown successfully were carried out in Iringa and Urambo. The Agricultural Officer (Tobacco) studied several areas in the Central, Western and Lake Provinces and advised on their suitability for Turkish tobacco. Small scale trials of the crop are to be made to determine where it can be grown economically.

By the end of the year plans had been made and staff were in training to commence the commercial production of the crop in the new year.

Wattle

The Tanganyika Wattle Company at Njombe completed the planting of 33,000 acres in 1956, and opened an extract factory early in 1959, and a total of 6,000 tons of extract were produced during the year. The Ubena Wattle Scheme, which enables African growers to produce bark for the factory, continues to expand. This scheme is not due to come into production until 1964.

A survey of black wattle in the Western Usambaras revealed that the acreage is now 15,336. The extraction plant at Lushoto is being extended to cope with the large increase in bark being delivered. It is estimated that 1,413 tons of wet bark were delivered to the factory giving 480 tons of extract. No further planting of wattle is encouraged in the Usambaras. The main production of wattle in the Northern Province is in Moshi, where the bark is sold to a tannery at Himo. The production of extract was about 250 tons.

Wheat

7,276 tons were marketed, worth about £211,000.

There was a very useful increase in acreage of wheat in the Northern Province, confidence having been regained to some extent following the almost "rust-free" season in 1958. Although the "short rains" crop was only half that of 1957/58, due to the scattered nature

of the rains, the crop was over 6,600 tons, which is the best production since the bumper year of 1954. The rather dry year was ideally suited to the "long rains" crop, and while there was more rust and bird damage this year, better yields were obtained. African farmers in the Likamba area of Arusha, who grow the crop themselves, had a good harvest. The weakness of their farming still lies in an inadequate range of machinery for seed bed preparation, which means poor stands and a waste of seed.

A depressing feature of the season was the further breakdown in Stem Rust-resistance of the only good short-term wheat "H 462". The variety can no longer be recommended for planting in the "long rains", and moreover another standby variety "1066" has also started to break down. There was a heavier bird attack in the Karatu area than has been known since control work began, but adequate control was eventually achieved.

Small quantities of wheat are grown in other highland areas where it is replacing maize to some extent. Yields were generally poor due to drought, rust and birds.

SECTION IV

MINOR CROPS

(a) *Barley*

The future of this important crop to the West Kilimanjaro farmers is most uncertain due to disruption of the pig industry following the restriction of the movement of live pigs to Kenya and the saturation of the malting barley market in Kenya following expansion of production there. As a result, the barley acreage was reduced considerably and produced approximately 700 tons.

(b) *Betel Nuts*

Betel nuts, mainly in the Pangani River area, continue to increase in acreage and production. 200 tons of nuts were produced, compared with 119 tons in 1958, and the quality was excellent.

(c) *Chillies*

Production is mainly concentrated in the Northern Province, where there is ample water for irrigation. Due to difficulties in selling the entire production in 1958, acreages were somewhat reduced, but improved drying methods and careful grading have continued. Chillies are grown in small amounts in other parts of the country.

(d) *Cocoa*

Interest in this crop continues to increase, and Mr. D. H. Urquhart from Messrs. Cadbury visited Tanganyika to advise on the suitability of various areas for the crop. A detailed survey of possible cocoa soils was done in the Tanga Province, and this work is being used as a guide in organizing the expansion of cocoa production in the limited areas which are suitable for the crop.

In Tanga Province several estates have planted trial plots and two are in production. The propagation of seedlings is being undertaken by the Department at Sigi, where nursery techniques are being perfected. A number of West African selections were planted in the nursery at Kizugu, but suffered at first from insect attack. Young cocoa at the Maramba estate has come into bearing comparatively quickly, and there is a good prospect of obtaining high yields. Production of dried cocoa was about 10 tons.

Trial plots in the Eastern Province were beset by misfortune, including bad weather at the time of planting, poor growth of shade trees, and devastation by vermin. In the Southern Highlands Province the rehabilitation of the few remaining trees at Njugilo has been successful, and the trees are now flourishing and carrying a crop of pods.

(e) *European Potatoes*

European potatoes are grown in most highland areas, mainly in the Southern Highlands and Northern Provinces. The crop is a useful food in these areas and the surplus is sold through Native Authority markets or privately. The total crop marketed is estimated at

over 2,500 tons of which 1,785 tons come from the Southern Highlands Province. There is much to be done to improve the husbandry, disease resistance, storing quality and marketing of the crop. The Department is encouraging the multiplication and growing of the blight-resistant variety "Dutch Robjyn".

(f) *Bananas*

Surpluses to local food requirements were sold from Bukoba, Moshi, Kigoma, Rungwe and Ukerewe. The amounts sold are difficult to assess but they are known to exceed 1,200 tons.

Bananas are the staple diet of the majority of the population in the West Lake Province. At the beginning of the year there were localized shortages.

In Tanga Province, the acreage under bananas increased during the year partly because estates in coffee growing areas are using bananas as shade. The replacement by resistant varieties of bananas susceptible to Panama Wilt continued throughout the year in the higher areas of Kilimanjaro.

(g) *Citrus and Other Fruits*

Messrs. L. Rose and Co., lime juice manufacturers, have established a base and a pilot extraction plant south of Mtwara. 4,000 seedlings were distributed within a radius of 10 miles of the plant during the rainy season and 75 per cent of these seedlings have taken. 25,000 to 30,000 seedlings have been raised for distribution during the coming season. The local population are showing their keenness by preparing fields and digging holes for the seedlings.

Kisarawe enjoyed a good season for tangerines, limes and lemons, and a bumper season for oranges. It is estimated that from 2,500 to 3,000 tons of citrus are produced annually for the Dar es Salaam market.

In Muheza near Tanga over 1,000 tons of oranges were sold on the export market compared with 725 tons in rather poor year of 1958. The extraction of juice has virtually ceased, due to the low grade which has little export value, and emphasis is now on the production of grapefruit which grows extremely well and are of a good quality.

Citrus continues to be a good source of income on Ukerewe Island in Lake Victoria. During the year 2,450 citrus plants were sold from the Nursery at Morogoro.

Pineapples were again plentiful in Kisarawe and Messrs. Tanganyika Packers have carried out a number of successful trials on packing this fruit. In Tanga Province production has fallen off badly owing to the lack of a suitable selling agency, and only sufficient for local consumption and a small export to Kenya is now grown.

Growers of mangoes in Kisarawe and Bagamoyo have developed a useful trade with Messrs. Tanganyika Packers who canned 216,000 tins of the fruit during the year.

Plums are produced in the Uwemba area of Njombe and the surplus was estimated to have been 8 tons.

(h) *Kapok*

Although the price of kapok remains very low, some 200 tons were marketed in the Tanga Province mainly by estates. The majority of trees on African holdings remained unharvested. In the Eastern Province the crop amounted to 655 tons compared with 732 tons in 1958.

(i) *Kenaf Fibre (Hibiscus)*

Trials were carried out in Arusha and Mbulu on the problems of the growing, harvesting, ribboning and retting of kenaf, both on peasant holdings and on estates. Some progress has been made, but so far the yields have been too low for economical production and the problem of large-scale retting has yet to be solved. Tests with the Newage ribboner have been successful. In experiments at the Tanganyika Agricultural Corporation farm at Lumemo in the Eastern Province yields of up to 1,780 lb. of fibre per acre have been achieved.

(j) *Onions*

Onions are grown in many parts of the country and provide a very useful addition to the diet and a valuable subsidiary cash crop. The total amount marketed was about 6,500 tons of which 3,575 tons were from the Northern Province. The season was favourable to thrips which caused considerable reduction of the crop. The average price to the grower was about Shs. 23/- per cwt.

(k) *Palm Oil and Palm Kernels*

This industry is centered in Kilimanjaro where the crop is sold as red palm oil and as palm kernels. Little progress was reported, although a few seedlings were distributed from the Simbo farm in the Luiche delta. In the Tanga Province, where production is confined to one estate in the Muheza area, 30 tons of palm oil and 20 tons of palm kernels were marketed. Total production marketed was about 80 tons of palm oil which is near average of recent years, and 898 tons of kernels which is a record.

(l) *Papain*

At the beginning of the year the price of papain in the Northern Province was Shs. 20/- per lb. but it had fallen to Shs. 12/50 by August. Production increased as a result of the higher prices at the beginning of the year and keen interest continues to be shown in improving the quality of the crop especially by better drying. With a view to trying to stabilize the prices, a Papain Growers Association has been formed by a number of growers to operate as a selling organization.

(m) *Vegetables*

Vegetables are grown on a big scale in the Ulugurus, Usambaras and Southern Highlands. The main problems are the periodic gluts and shortages and rapid transport to market. There are three Chinese owned market gardens near Dar es Salaam. At least 550 tons were marketed from the Ulugurus, 650 tons marketed from the Usambaras and 526 tons from the Southern Highlands.

(n) *Spices*

Black peppers are grown in several districts but no figures of production are available. One estate in Tanga, produced five tons. Cardamom growing is increasing in Tanga Province and the price of 20/- per kilo is attractive to the growers. Clove growing is increasing slightly in the Usambara and Uluguru mountain areas.

(o) *Gums*

Gum arabic is produced in several of the drier areas of Central, Lake and Western Provinces where it forms a useful reserve cash crop when others fail. 1,690 tons were marketed. Small quantities of gum copal are collected in coastal districts.

(p) *Essential Oils*

Small quantities of essential oils are marketed. One estate in Tanga produced 10,000 lb. of bitter orange oil.

(q) *Other Crops*

Rubber is produced on one estate in Uluguru. Raffia is a useful cash crop in some districts, for instance in Bagamoyo it is worth £2,500. Only 30 tons of Allanblackia nuts were marketed.

SECTION V

INCREASED PRODUCTIVITY SCHEMES

As recorded in last year's report, Colonial Development and Welfare assistance was obtained in 1957 for 29 schemes for increasing agricultural productivity. Good progress was made on ten of the thirteen schemes based on coffee. For instance in North Mara production has increased from 4½ tons to 10 tons and quality is excellent. In Rungwe the first target of 2,000 tons production will be exceeded and a new target of 4,000 tons has been fixed. In the Matengo Scheme production increased to over 1,000 tons of coffee in 1959. Coffee nurseries have been established in almost all the areas and planting and production continue to increase.

Three schemes are for increased pyrethrum growing. The Njombe scheme has made rapid and excellent progress due to careful planning and the keenness of the people. Pyrethrum production was started in 1957, and the object was to have 1,800 acres under the crop by 1962. Such has been the speed of progress, however, that 1,022 acres were planted in 1959. Production of dried flowers has increased from 9 tons in 1957 to 67 tons in 1959. Progress in Arusha has not been so rapid, although interest has been awakened, nurseries have been established and prospects for 1960 are considerably brighter, as more land has been made available for cultivation of the crop. In Mbulu two simple driers of the type used in Kenya have been erected and these will improve the quality of the crop.

The provision of a mobile workshop with staff to assist the peasant farmers in the Rufiji valley to maintain their machinery in good order has not been a success. Many people resent the rates which the ploughing contractors charge and the contractors consider that the repair of the tractors should be a free service. Some of the contractors have had few orders and are in financial difficulties, but there was an increase of 6 tractors compared with 1958.

In the Usambara mountains there was a shortage of blight resistant seed potatoes in a suitable condition for planting at the right time. A scheme was therefore introduced for the growing, storing and distribution of seed of the blight resistant variety 1521 (C3). The scheme achieved its object, and will now be discontinued, as the Native Authority is prepared to meet the recurrent expenditure for bulking of the seed.

Although the Central Province supports large numbers of cattle, little use is made of them for ploughing and other farm work. A scheme was therefore devised for the training of oxen and considerable success was achieved in Iramba and Mpwapwa. In Mpwapwa, not only have 200 oxen been trained, but also 60 donkeys which have proved easier to train and quicker to learn. Several people have set up as ploughing contractors, charging Shs. 30/- or Shs. 40/- per acre. The Native Authority has provided money for loans to enable people to start ox-ploughing and also for the purchase of spare parts and chains for resale. Interest in the other districts of the Province is not very great so far.

Several schemes were based on a number of different crops. In Handeni, cotton production increased from 207 tons in 1957 to 500 tons in 1959, and 135 tons of cowpea—a new crop in the area—were marketed in 1958. Unfortunately the cowpea crop in 1959 failed due to drought. Part of scheme involves the construction of wells, but progress here has been held up by difficulty of access and shortage of labour for digging. In the Nguu Mountains of Handeni agricultural production is being encouraged by providing access roads and the necessary advisory staff. Reasonable progress has been made despite the difficulties attendant upon the opening up of a remote area. A total of 37 miles of new roads have been constructed since the scheme started, and about 30,000 Robusta coffee seedlings were sold during the year. In the Tanga District the emphasis has been removed from Robusta coffee and kapok, and trial plots of cocoa, citrus and spice trial plots have been established.

The plan for controlled movement of Warangi tribesmen from the eroded uplands of Kondoa into the plains below has had little success so far. The plan envisaged settlements with controlled grazing and encouragement of groundnuts and cotton. A groundnut and castor production scheme in Manyoni has failed as the interest of the people was not maintained.

In Songea the flagging fire-cured tobacco industry was revived. The people have long experience of the crop, and are willing to take advice and follow new methods only if it can be shown that these will lead to bigger profits. A good start was made, and a marked improvement both in quantity and quality of leaf was obtained. The percentage of top grade leaf has been increased by 50 per cent.

Two schemes were based on the increased production of fish. The development of the "dagaa" fishing industry on Lake Tanganyika made no headway, but the stocking of small lakes, rivers, dams and swamps in the Central Province has been an outstanding success. Hundreds of fishermen from all over the territory moved into the Province and large quantities of fish were caught.

SECTION VI

VERMIN AND GENERAL PESTS

Measures to prevent the introduction of the Khapra beetle (*Trogoderma granarium*) into Tanganyika continued. Under the 1957 Plant Protection (Compulsory Fumigation of Imports) Order scheduled import cargoes suspected of harbouring the pest are prevented from entering the Territory until either they have been fumigated, treated with an insecticide in an approved manner or have been passed by an Inspector as free from infestation.

A Field Officer (Agriculture) carries out full time duties as an Inspector for the port of Dar es Salaam; elsewhere these duties are carried out as required by Extension Officers of the Department.

Spices imported from India and the Far East have invariably been found to be infested with the Khapra beetle. Arrangements made by Shipping Companies to load this type of cargo in one hatch of a ship, have been responsible for a decrease of the amount of other cargo which has had to be fumigated as a result of suspected cross-infestation.

Two outbreaks of Khapra beetle were detected in Dar es Salaam. The infested grain and warehouses were treated and subsequent inspections ascertained that these outbreaks had been controlled.

In Dar es Salaam port 97 ships carrying cargo which was likely to be infested with the Khapra beetle were inspected. Of these, 43 ships were carrying some cargo which it was necessary to fumigate.

No infestations were detected elsewhere, but a close watch was kept on produce entering the Territory from Rhodesia and Nyasaland.

1959 has been notable for the success of the campaign to control grain-eating birds (Sudan diochs) both in the nesting and migrating seasons, and for the comparatively minor damage done to wheat and other grain crops. The birds which breed in Tanganyika migrate later in the season to Kenya and attack wheat, so the Kenya and Tanganyika bird control teams work in close co-operation. In fact the Kenya Bird Control Officer spent most of his time in Tanganyika directing the operations against nesting colonies. The success of the campaign can be largely attributed to his new technique of aerial spraying of large areas, thus ensuring that not only the young but also the adult birds are killed. Of the 1,760 acres of nesting sites which were destroyed during the year, 110 acres were cut down by local hand labour, 450 acres were destroyed by flame throwers and 1,200 acres by aerial spraying. It is estimated that some 104 million birds were destroyed during this campaign in the wheat growing areas. Special attention has been given this year to discover whether aerial spraying kills other species of birds besides Sudan Diochs. It is gratifying to note that only 5 other birds were discovered dead after spraying.

The work of the Zoologist is producing some very useful data on the breeding and migration of these birds.

The prickly pear scale insect (*Dactylopius tomentosus*) is continuing to kill clumps of prickly pear (*Opuntia* sp.) which has spread over and ruined much of the pasture land in Musoma and North Mara. Agricultural Instructors spread infected cladodes to uninfected clumps, and material has been sent from Musoma to Geita, Mwanza, Ukerewe and the Scott Laboratories in Kenya.

The Vermin Control Units of the South East Lake County Council continued to do good work in reducing the number of porcupine, pig, baboon and hyena. The numbers of pig and porcupine have shown a marked decrease, which is attributed to the efforts of the units, but baboon, while continuing to be successfully dealt with, are an ever-present menace and need constant attention.

In many parts of the Eastern Province there was considerable rat damage to cotton, and local farmers have been encouraged to use Warfarin 5K. In the Matengo Highlands, a large species of rat which climbs the coffee trees and eats the ripe berries caused considerable damage, and efforts were made to effect some control. Otters are a serious manace in the Songea fish ponds.

Severe damage to crops in many parts of the Territory is done by other animals, such as elephant, hippo, buck and monkeys.

The use by farmers of crop protectant sprays and dusts and grain protectant dusts is increasing. Staff of the Extension Service assisted in their distribution where normal trade channels proved inadequate.

A number of small swarms of red locusts (*Nomadacris* sp.) moved west across the Wembere towards the Malagarasi plains during August, September and October. The International Red Locust Control Service located their course and sprayed them with D.N.O.C. The locusts did no damage and provided a welcome addition to the diet of some of the hungry people of the Western Province.

SECTION VII

LAND PLANNING, SOIL AND WATER CONSERVATION AND LAND USAGE SCHEMES

There are three land planning units under the control of Land Planning Officers based on Tengeru, Iringa and Ukiriguru. In addition there is a Land Planning Training Centre at Morogoro from which teams of surveyors are made available to officers in other parts of the Territory. There are two mechanical services available for the construction of soil conservation works in the Northern and Southern Highlands Provinces.

Northern Region Land Planning Unit

The major work was the settlement scheme designed for surplus population from the Arusha District. A reconnaissance survey of 750 square miles of the Lolikisale—Ardai—Makuyuni area, was continued from 1958. Within this area, one unit was selected for settlement, mainly for ranching and a restricted amount of arable land. The elders of the Waarusha tribe have agreed to accept the suggested conditions for settlement, roads of access have been planned, arable areas have been demarcated and the land has been subdivided into paddocks by officers of the Land Planning Unit.

Mapping and land utilization surveys were done in Kidete, Tengeru and Mbulu.

In Central Province a detailed survey was made of the proposed irrigation area at Dabalo, maps were made of two proposed settlement areas in Kondoa District.

In Tanga Province reconnaissance was made of the Maramba area for cocoa planting and Kalimawe and Manka for irrigation projects. Two areas in Tunduru in the Southern Province were surveyed for possible irrigation.

Central Region Land Planning Unit

Much of the work of the Agricultural Officer (Land Planning) was concerned with reconnaissance and soil surveys and assessment of proposed irrigation schemes at Pawaga, Lugarawa, Lake Mansi and the lower Lukosi river basin. A report was prepared on the Kalenga Irrigation area. A map and land use plan of Ismani were completed and a reconnaissance of the Kiwere tobacco area made. A reconnaissance survey of possible tea growing areas in the Ifakara/Kiberege highlands was made and a more detailed survey in the area proposed for a tea scheme for peasant farmers at Lupembe.

Western Region Land Planning Unit

Officers of this unit prepared detailed land use plans of Mwanhala and Ukiriguru. They also did a detailed survey of 2,000 acres of badly eroded land in Ukara Island and planned soil conservation. A detailed survey of a drainage system for the Mkibuga swamp in Ukerewe was almost completed, and surveys of four dam sites in Nzega and one in Maswa as well as farm plans for three African farms were also prepared.

The Land Planning Training Centre

Teams from the Training Centre completed 34 surveys and prepared 151 maps and plans to assist the Land Planning Officers and meet other Departmental requirements.

Mechanical Services

With the closer integration of the work of the Northern Province section of this service with that of the Agricultural Officer (Farms and Estates), increasing emphasis has been laid on the construction of soil conservation works and water storage. Work done during the year included 438 acres of broad-based terracing, 66,000 feet of diversion ditching and two dams. In addition, 69 miles of roads have been made or regraded. The service provided to farmers by the two Agricultural Officers and the Field Officer (Farms and Estates) has again proved extremely popular. Many farmers have undertaken the construction of soil conservation works either with their own equipment or with machinery hired to them by the service and technical advice and help in laying out the works have been given. There are some 270 African farmers in the Northern Province who farm over 50 acres of land, and of these 91 farm over 100 acres. Most of these farms are not protected from erosion, but it is interesting to note that the first of the African farmers paid for the construction of some 3,000 feet of diversion ditching in 1959.

The Southern Highlands section of the Mechanical Services was hampered by breakdowns and difficulty in obtaining spares and repairs. During the second part of the year, there was a reduction in demand for soil conservation work but the machinery was usefully employed on road-making and miscellaneous work. 503 acres of land were terraced, 14,200 feet of diversion ditching, 7,700 feet of artificial waterways and two dams were constructed.

Land Utilization Schemes

The land-use scheme in North and South Pare, which has been operated for the past five years on a purely voluntary basis, continues to make solid progress, and is slowly extending to new areas away from the initial focal points. The planting of Arabica coffee has given an added impetus to progress in land utilization as a perennial crop is suited to the steep slopes in the area.

Little progress has been made in improving agricultural practices in the Uluguru Mountains since legal sanctions were withdrawn.

Controlled settlement after demarcation of the land and provision of roads and water supplies continued in Geita. Following the repeal of most of the Sukumaland Agricultural Rules, 1959 has been a year of retrogression. In many areas tie ridging was neglected and considerable erosion occurred as a result. Several areas that were previously closed to stock and where soil conservation measures had been constructed, were opened to grazing.

In the Mbozi water conservation scheme the people are now beginning to see the benefits derived from the protection of erodable areas, and from the installation of water points for the protection of springs and streams.

People in the Central Province are becoming reluctant to do communal work such as soil conservation measures. In two districts however, old hafirs were cleaned out and wing ditches dug to collect more water. In Kondoa a further 800 acres of land were protected by contour banking and further dams and hafirs were built.

SECTION VIII

IRRIGATION

The provision of water does not solve all the agricultural problems of the arid areas and indeed it has increased certain problems. For example game and vermin concentrate on these areas, salinity is often evident and many crops will not grow well out of season despite ample water.

Valuable experience is being gained at the various irrigation schemes to help to find the solution of these and other problems.

At Mang'oinyi and Ikowa in the Central Province many experiments were done to find out the best crops to grow, the best times of planting, the best spacing of crops and the amount and timing of water application.

There are now 55 tenants in the Mang'oinyi irrigated area and 8 at Ikowa.

The productivity of the lower areas of Kilimanjaro and Meru largely depends on irrigation. Progress on the Uru Chini Irrigation Scheme has been held up by the failure of the Chagga Council to reach any decision on the practical recommendations of the sub-committee which was appointed in 1958 to report on the scheme. There was further installation of overhead irrigation, both in the main coffee belt and on farms in the Rift Valley where it is widely applied to papain, chillies and coffee.

At the Kalimawe dam in Tanga Province, the 7 mile high-level channel commands an area of approximately 700 acres of generally saline soils, where cultivation is likely to prove difficult. A leaching trial was laid down in the area. The storage of water in the dam has reduced flood damage to paddy and maize lower down the valley, but a number of problems concerning rates and time of water discharge remain to be solved.

At the Mlali Irrigation Scheme in the Eastern Province most growers have now adopted the practice of early planting. A sample survey of 12 growers showed an average of 3,366 lb. of paddy to the acre, which compares very favourably with the 1,300 lb. in 1956/57 and 2,800 lb. in 1957/58. Two successful field days were held. There were 181 cultivators working on the scheme in 1959.

In the Kilosa area there have been two encouraging examples of self-help concerned with irrigation schemes, 100 growers collected funds with which to purchase building materials to repair the sluice gates at the entrance to an old furrow which irrigates 500 acres at Kilangale. At Mwasa, cultivators moved over 3,000 cubic feet of soil to provide themselves with a new inlet. They also built flood protection earthworks and carried stones and material for building a sluice inlet. The main irrigated crop at Mwasa is onions.

At Malya in the Lake Province, rainfall was light and finished early and supplies of water in the dam were insufficient to maintain adequate irrigation, with the result that yields were about 25 per cent lower than in 1958. The ten-acre irrigation scheme below the Sola dam in Maswa grew its first crop of paddy this year, and good yields were obtained.

The poor rains in 1959 gave considerable impetus to rice growing under irrigation in Unyamwezi in the Western Province. The rain grown crop was an almost total failure, whilst wherever dams filled, good crops of up to 4,000 lb. of paddy per acre were obtained by irrigation.

SECTION IX

ANIMAL HUSBANDRY

Animal husbandry is the joint responsibility of the Veterinary and Agricultural Departments and the two work in close co-operation.

In the Northern Province, the woman Field Officer who began work among the Chagga women in 1958 has continued to encourage the planting of fodder grasses, particularly *Setaria splendida* and Glabrous Napier Fodder. In other areas the people have been encouraged to plant elephant grass as a windbreak, erosion control and fodder grass.

Satisfactory progress has been made with the scheme to develop animal husbandry in Masasi and Lindi. In the Masasi District a Field Officer has been employed principally on the training of work oxen, the introduction of improved heifers and bulls, the use of manure, barbed wire paddocks, grazing and tick control. The local people had very few cattle and were very ignorant about methods of animal husbandry and the use of oxen for ploughing and other farm work. After a slow start, progress can now be reported both in demands for cattle and for training of oxen and men for ploughing. The centre for this ox-training was at Mahiwa farm, financed by the Lindi and Masasi Native Authorities.

In the Lake and West Lake Provinces work was mainly on pasture improvement, based on the Natural Resources Centres. In Western Province hay-making was demonstrated. The Agricultural Department has co-operated with the Veterinary Department in running chick rearing units at Mbozi, Maruku, Mwanhala, Nachingwea and Ilonga.

SECTION X

MECHANIZATION

The Tanganyika Agricultural Machinery Testing Unit was transferred from Malya to Tengeru in April to operate in closer contact with the East African Tractor and Implement Testing Unit which has its headquarters in Kenya. Plans and working drawings were made for two test rigs. The first of these is a self-propelled rig for testing ox carts and planters and the second is a power-driven machine for examining the wear rate and output of hand spray pumps. The machine accurately simulates the motion and speed of human operators. Test reports were forwarded on the Lepe groundnut sheller, Connoley ox cart and the Safim single row planter. A second castor seed separator and sheller and a Kenaf fibre washing machine were designed and manufactured during the year. A second fibre washing machine together with framework for a retting tank were almost completed.

The use of tractors for ploughing continues to increase, both for farmers ploughing their own land and for contract work. The biggest development in recent years has been in peasant farming, notably in the Mkomazi and Rufiji Valleys for rice growing and in the Northern, Lake and Southern Provinces. The main weakness of tractor ploughing in African farm areas is the lack of ancillary equipment so that ploughing is rarely followed by mechanical cultivation, seeding, weeding and harvesting.

Ox-ploughing is of much greater importance than tractor ploughing and is receiving active encouragement. Ox ploughing is rapidly replacing hand hoeing in almost all suitable land free from tsetse. There are 16,000 ox-ploughs in North Mara and Musoma alone and large numbers in Nzega and Singida. Ancillary equipment such as cultivators and seeders are still rare but their use is being encouraged, particularly in Western and Central Provinces. With the co-operation of the East African Tractor and Implement Testing Unit a large-scale field experiment using the Hawkins tie ridging equipment was organized at Oljoro. The preparation of the land was just completed in time for the first heavy downpour of the short rains, and it is planned to make soil moisture measurements during the cropping season.

Ox-carts are not generally popular due to their high initial cost, but numbers are gradually increasing. For instance in Maswa an attempt to popularize the use of ox-carts for hauling dung by putting Native Authority carts out for contract work has stimulated interest in manuring and in the purchase of carts. In Ufipa the Field Officer made specimen carts from old lorry and car axles and showed people how to make better yokes and other equipment.

Tests are being done to obtain information regarding the number of oxen and the implements that will be required by farmers on the Tanganyika Agricultural Corporation's settlement scheme at Urambo when the scheme becomes dependent on the oxen instead of tractors.

In many parts of the Territory there was an increasing demand for coffee pulpers, spraying equipment, maize mills, wheelbarrows, paddy threshers, groundnut and maize shellers and semi-rotary pumps.

SECTION XI

STAFF TRAINING AND AGRICULTURAL EDUCATION

There was a considerable intensification of staff training this year. A ten-year training programme was prepared with the main objects of reducing the number of the present Subordinate Service staff, and replacing them by Field Assistants, who would be obtained either by training and promotion of the better Subordinate Service staff or by direct recruitment of more highly educated men. Plans were also made to provide further training for outstanding Field Assistants to fit them to become Senior Field Assistants. Nine selected Field Assistants were given experience in an area entirely different from the one in which they had been working. This was followed by training in land planning, soil conservation, community development, agricultural extension and office routine. After this comprehensive in-training course, seven of the nine were promoted to Senior Field Assistant. Plans were made for overseas training for selected local staff so that they could be prepared to fill a higher proportion than they do at present of the senior posts in the Department. It was

arranged for Senior Field Assistants to receive training in the Faculty of Agriculture at Makerere College, which might lead to their promotion to the Field Officer cadre. An Experimental Officer was sent on a one-year course to Britain to qualify him as the first African Plant Breeder in the Department.

At the Tengeru Natural Resources School, which is the main training centre for Departmental Field Assistants, the system of recruitment was changed. In future all entrants to the course will be required to spend at least one-year on practical work in the field before they are accepted for training. The fact that it is now possible to recruit potential Field Assistants straight from school has resulted in a much higher standard of entrant since such men receive a salary from their day of appointment, and has allowed a "weeding-out" of unsuitable men before the students enter the Natural Resources School. A Standard X two-year course and a Standard VIII three-year course were completed at Tengeru, and 46 out of the 48 students passed their examinations. At the end of the year 24 second year Standard X agricultural students, who had been recruited under the previous system remained in the school. They will complete their course in 1960 and be replaced by the first students who have been directly employed.

At the Ukiriguru Agricultural Training Centre the Subordinate Service Instructors' simplified one-year course continued and 26 of the 28 students passed their examinations. There was also a one-year course for 22 school teachers, who teach agriculture in Middle Schools and who all passed their examinations. The two-year course for Standard VIII Subordinate Service Instructors continued, and the enrolment totalled 39. The new courses which began towards the end of 1959 were the first year of a new two-year course (24 students) a new one-year simplified course (19 students) and a new teachers course (24 students). 15 of the 16 students on the Wives' Course completed their year successfully, and a further 17 were enrolled at the end of the year.

The Mahiwa Training School in the Southern Province was closed down after the last nine-months course for 23 teachers was completed.

At the Land Planning Training Centre in Morogoro, 23 students of this Department and 22 from the Forest Department were in various stages of training in surveying at the end of the year. Earlier in the year, 30 Junior Survey Assistants had been examined by the Provincial Land Surveyor at Morogoro, and all had been granted a satisfactory pass mark.

In-training of staff of all categories was intensified during the year. A three-week course was held at the Ukiriguru Training Centre in September/October, which was attended by 80 Field Assistants from the Lake, West Lake and Western Provinces. The object of the course was to teach up-to-date agricultural techniques, to serve as a refresher course for many of the more experienced Field Assistants, and to give them a wider outlook by letting them hear about the activities of other Government departments and organizations.

At the Southern Regional Research Centre at Nachingwea twelve Field Officers from the Southern and Eastern Provinces attended a two-week course in August on agriculture and fisheries extension work, and in September senior officers and field staff from the Northern and Southern Highlands Provinces assembled in Njombe for a course on pyrethrum.

Ox-ploughing courses were organized at Urambo, Njugilo, Mang'oinyi and Ikowa. Field Assistants and members of co-operative societies in Lushoto travelled to Tengeru for a one-week course in coffee growing and general extension work. In Bukoba the supervisors of the pruning teams attended three practical refresher courses just before the pruning season began. The Field Officer (Fisheries) in the Central Province ran a course on fishing for Field Assistants. Training was given in fruit-tree grafting at Morogoro, in Turkish tobacco growing at Urambo, in tractor maintenance at Wami, on irrigation techniques for Field Assistants in the Central Province, on the use of fertilizers on cotton at Ukiriguru and on coffee culture at the Mbozi coffee station.

At the Land Planning Training Centre at Morogoro, fourteen Field Assistants attended a three weeks course on the construction of small dams. During the course students built a small dam in the grounds of the Centre. As in the previous year expatriate officers joining

the Department on arrival in the Territory were given a seven weeks Swahili background course provided by the Social Development Department, and the course was again supported by lectures on agricultural administration and policy.

The Department continued to give guidance to teachers of Primary and Middle Schools, but as the numbers of these increase it is becoming more difficult to ensure that a high standard is maintained. It was decided to discontinue the cultivation of demonstration plots in Standard V of Middle Schools, and also to relieve small children in Standard I and II of primary schools from practical agricultural work, as the age of entry has now been reduced in most areas.

SECTION XII

AGRICULTURAL EXTENSION

To "practise what you preach" is an essential pre-requisite of successful agricultural extension and great emphasis has been placed on the setting of high standards of farming and gardening by all members of the Department. Field Assistants and Instructors in particular have been taking care to ensure that the soil on their land is properly conserved, that the correct practices of cultivation of the various crops are followed and that permanent crops are maintained in good condition. In Mpwapwa every member of the staff has been taught to plough with oxen, and in Ngara the fact that the farm practices of our staff are now of such a high standard has helped to produce the dramatic change of heart shown by cultivators in pruning and mulching their coffee.

Extension work has shown a very wide variation both in methods used and in success achieved. In the Lake Province, in Lushoto and in parts of Morogoro resentment caused partly by the enforcement of agricultural rules and regulations has made the task of extension officers very difficult. In parts of the Northern, Southern and Southern Highlands Provinces the reputation of the Department is so high and its advice is so much in demand that it is often impossible to deal with all the requests for assistance which are received. In the Eastern Province the improvement of cotton production is linked closely with the application of insecticides. In Bagamoyo the cultivators are taking to the use of insecticides with enthusiasm, whereas in Rufiji virtually no progress has been made. In South Sukumaland the reaction against the Department was so strong after compulsory rules for good husbandry had been cancelled, that in some cases manure already applied to the land was scraped together and returned to the cattle yards, while in Ukerewe Island, a manuring campaign was so successful that cultivators paid Shs. 10/- per load, and demand exceeded the supply of transport available for the work.

Field staff has been encouraged to test various extension methods and to exploit those found to be successful in local conditions. For example, in Iramba notice boards were set up to inform people of agricultural progress in other parts of the District; a ploughing match spread new ideas and allowed local experts to demonstrate their prowess; self help in the digging of tank dams was successfully fostered, the fishermen on Lake Kitangiri have been assisted to obtain nets, hooks and insecticides to protect their dried fish, seeds have been obtained, trial plots laid down, nurseries started, a series of recorded one-act plays have been featured throughout the district, an African woman Instructor has been engaged and training courses in English have been organized.

The Senior Field Officer in Kisarawe instituted the "ten men" idea, which is a specialized form of the "focal point" approach, whereby each member of his staff selected ten promising farmers and concentrated on helping them to improve their farming methods. The Assistant Agricultural Officer in Nzega has been running village courses on cotton cultivation. At Lushoto a film on coffee culture prepared by the Agricultural Officer was used, together with other visual aids, to help to build up cordial relations with the farmers, while teaching better agriculture. The method of extension work used by the Field Officer (Fisheries) in the Central Province deserves special mention in view of the success which has been achieved. He has a staff of three Instructors who are themselves expert fishermen and some of the older officers of the Department might be horrified to see this band dressed in a varied assortment of fancy clothes, with trade union badges displayed. At a fishing village, they

construct their own huts, and live and work like the fishermen. They bring improved equipment and use improved methods, and by example they influence the fishermen to adopt the better practices. There is no exhortation, no large-scale meetings, no compulsion and no impatience if the fishermen do not change their traditional ways of fishing. In time, usually quite a short time, the improved methods are adopted by the fishermen, and the team then moves on to another inland water and repeats the process.

Very important in extension work is the frequent personal approach and demonstration of techniques as exemplified in Moshi where considerable success has been achieved by concentration on the progressive individual. Similarly in Njombe extension staff has taught pyrethrum cultivation so effectively that almost every field is well managed and conserved. In North Mara, coffee which is a comparatively new crop, has been grown and prepared for market almost exactly as advised, and as a result very high yields and quality have been obtained.

Farmers' Days were held at many centres. At the Mlali Irrigation Scheme two such days were organized to show the results of experimental work. The Northern Regional Research Centre at Tengeru had a successful field day for farmers and on another occasion the Agricultural Officer (Farms and Estates) conducted a party of some 40 farmers from all parts of the Northern Province round a well organized non African farm. At Kitungwa in the Eastern Province the beneficial effect of insecticide on cotton yields was shown to farmers from several districts.

The agricultural newspaper "Ukulima wa Kisasa" (Modern Farming), which was begun on a small scale in 1955 in Musoma, was built up during the year into a Territorial magazine. It is edited and distributed by staff of the Department, and supported financially by subsidies from the Lint and Seed Marketing Board and the Tanganyika Coffee Board. During the year its circulation increased from 1,700 copies per month to 10,000 copies, thus establishing itself as one of the leading Swahili periodicals in the country. It is a farmers' magazine in which the cultivators are encouraged to state their views and are given information about the success achieved by their fellow farmers, price trends of the main crops in the Territory, modern methods of cultivation and processing, agricultural developments overseas and discussions on territorial agricultural policy. An encouraging feature of the year has been the growing interest shown by advertisers, and advertising income increased from some Shs. 600/- per month to over Shs. 2,000/-. The use of the written word in extension is not confined to articles written in "Ukulima wa Kisasa", as several officers contribute articles to other local vernacular papers, and 64 general press releases on the activities of the Department have been issued through the Public Relations Department. Practically all of these were printed in one or more of the Territorial newspapers.

The weekly half-hour radio programme entitled "Maarifa ya Ukulima" (Agricultural Information), continued to be extremely popular and, with the rapidly increasing number of radio sets, its influence is becoming greater. The programme is divided into two parts; the first part normally consists of news items supplemented by recorded interviews and feature programmes collected about agricultural developments in various parts of the Territory. The second part is a serial play entitled "Mzee Simba" and concerns the day to day activities of an average farmer. Particularly successful features broadcast during the year were a fifteen minute programme about the successful soya bean breeding work at the Southern Regional Research Centre, a ten-minute feature programme about the Mlali Irrigation Scheme, interviews with groups of unemployed people from Dar es Salaam who set up a co-operative farming enterprise in the Kilombero valley, a feature describing the method of application of dieldrin to coffee trees in Bukoba to control White Stem borer, and a number of programmes featuring traditional digging songs.

Many districts decided to economize by not holding agricultural shows in 1959, but the local authorities of Kibondo proved that it is possible to organize two successful shows for as little as £50 each. Five agricultural shows were held in the Southern Province, three in Central Province, three in the Lake Province and one in Tanga Province. Natural Resources Centres have been constructed in many areas, and although the emphasis in most cases is on livestock, they are also the centre of agricultural extension work in the area.

SECTION XIII

FISHERIES

The assessed annual production of Tanganyika fisheries is 50,000 tons of fish worth £2,500,000.

In order to bring about closer integration with agricultural extension, considerable attention was paid this year to in-training in fisheries work for the agricultural field staff at all levels. Courses in sea fishing methods were held for the staff of the coastal districts; instruction on fresh water fishing was provided for the staff of the inland districts.

In November and December, the Food and Agriculture Organization of the United Nations, in conjunction with the Tanganyika Government, held, at Tanga, a "Training Centre on Fishery Surveys for Countries in the African Region". This course was attended by senior fisheries staff from various territories in Africa and by lecturers from other parts of the world. The Fisheries Officer (Headquarters) acted as a Director of this Centre which was also attended by the Marine Fisheries Officer and the Field Officer in charge of fishery development in Central Province.

Marine Fisheries

The Tanga Province coast, with headquarters at Pangani is the focal point for the development of the inshore fisheries. The Marine Fisheries Officer visited Mafia and the Southern Province, in particular Kilwa and its off-lying islands, and made a survey of the potentialities for inshore fisheries development.

There is continued interest among African fishermen in the advantages of nets and cordage of synthetic fibres (principally nylon) particularly the large blue nylon shark net of 6 in. mesh. Although Government loans are available for the purchase of these nets, it is indicative both of the independence of fishermen and of the proven quick cash returns obtainable, that the majority of nets were purchased outright for cash.

The Department is paying increasing attention to developing the use of outboard engines by coastal fishermen and outboard motors particularly suited to local fishing craft are now readily available.

The work of the East African Marine Fisheries Organization, Zanzibar, was of particular interest to Tanganyika this year. Experimental fishing in our offshore waters with the Japanese type tuna long line has revealed the presence of stock of tunnies, marlins and other large pelagic fish which might well have possibilities of commercial exploitation. This organization is undertaking a survey of existing and potential prawn fisheries in our estuarine waters. This survey commenced in the latter part of the year in the Pangani estuary and is already yielding information of considerable interest.

Inland Fisheries

Freshwater fisheries of the Territory account for 90 per cent of production and at least half of the inland catch comes from Lake Victoria.

There are large, and mostly unrecorded, exports of dried and smoked fish from the major lakes to profitable markets in neighbouring territories. This trade, and increasing local demands, especially in the heavily populated and relatively wealthy Lake Victoria region has led to unfulfilled demands for fish in many areas. In consequence the growing demand for fish in the interior of the Territory is being met by the development of minor fisheries of all kinds, ranging from rivers and the smaller lakes to dams and fish ponds.

The development of minor fisheries in the Central Province was continued with the stocking of dams and lakes, and the advice and assistance to fishermen has been extremely successful.

The two most spectacular results of this development were the opening up of what is now the largest fishery in the Province on Lake Kitangiri and the creation of an entirely new fishery on the Hombolo Dam. Lake Kitangiri, which less than two years ago supported

only a small subsistence fishery for cat-fish and lung-fish, has been shown to have among the highest catch rate for *Tilapia* of any lake in Africa and is probably one of the most fertile freshwater fisheries of the world. With the introduction of nylon nets, the encouragement of fishermen to move on to Kitangiri from other waters and other measures taken to build up the fishery, production rose to 100 tons of wet fish per month during the dry season. At present the fishing is of necessity seasonal because of communication difficulties during the rains, the main and most accessible markets being northwards to the Lake Province. Steps are being taken to improve communications out of the area including a link with the future all-weather East-West road.

Hombolo Dam was stocked by the Department and fishing began in October 1958. During 1959 production averaged 14 tons per month, and the fish is sold mostly to Dodoma.

There was an increasing interest in the production of fish on sisal estates in the Eastern and Tanga Provinces and a number of estate dams have been stocked and advice and instruction given on fishing. On one sisal estate a large pond, heavily charged with sisal waste, is supporting a population of the Catfish, *Clarias mossambicus* which are caught and eaten by the estate labour. This fish is an air-breather and is living in conditions which would be quite unsupportable for *Tilapia*.

The building of family fish ponds or "stew-ponds" in Songea has continued at a lively pace. By the end of the year there were over 2,000 ponds and they form a most impressive sight from the air. It is difficult to obtain an estimate of the overall production from these ponds, which vary greatly in size and productivity, but they are undoubtedly making a valuable contribution to food supplies in an area where animal protein from other sources is lacking. Increasing depredation by otters has presented a new problem which will require investigation. The movement for building fish ponds has spread to the neighbouring Tunduru District and this has been assisted by the posting of an instructor to Tunduru and the construction of ponds for the provision of fish fry and fingerlings.

A survey was carried out of the fisheries of the Ruvuma River which is an important source of much of the fish consumed in the Southern Province. This survey revealed that a great variety of fish is exploited by a wide range of ingenious fishing methods. The Ruvuma fisheries have two peak seasons, on the receding flood waters, when fish are caught on their return to the main stream, and at the end of the dry season when fish are concentrated in pools. As a result of this survey, recommendations have been made which should result in an increase of production from the river. Apart from technical improvements, the Ruvuma fisheries would greatly benefit from closer riverine settlement and better roads of access.

SECTION XIV

RESEARCH

A full report of the Research Division is given in Part II of the Annual Report.

The laboratories and most of the housing for the four Regional Research Centres were completed. The staff position is reasonably satisfactory but posts remain vacant for one senior research officer, two plant-pathologists and one agricultural chemist.

Soil Fertility

Steady progress is being made in the investigation of soil fertility problems. On the poor leached sandy soil of Bukoba the application of farmyard manure and some fertilizer in the planting hole resulted in the growth of very good Robusta coffee trees. At Mwanhala, farmyard manure or fertilizer gave greatly increased yields of several crops so long as these were planted early. On land that had received farmyard manure or fertilizer over the past three years, maize yields of 1,314 lb. and 1,237 lb. as against 369 lb. per acre for the control were obtained in a year of low rainfall.

At Nachingwea and Ukiriguru, again, useful responses to fertilizers and manures were obtained. At the former station the response to farmyard manure or the ash of an equivalent amount plus nitrogen lost on burning was the same for both maize and soya bean.

Date of Planting

At Mwanhala, results of the past two years have shown most clearly that early planting is necessary in order to get full benefit from the application of fertilizers. By planting in December, economic responses were obtained for maize, sorghum, groundnuts and soya-bean. A delay of one month reduced the responses to such an extent that these were no longer economic.

The results of four years work at Ilonga have shown that ridge cultivation to prevent surface run-off of water has had no effect in counteracting reduction in yields due to late planting.

Irrigation

At Mang'oinyi and Ikowa both manure and fertilizer have given appreciable increases in yields of maize, groundnuts and soya-bean. Yields were generally on the low side except for rice, some varieties of which produced 3-4,000 lb. of paddy per acre and maize which produced an average of 2,500 lb. per acre at Ikowa.

It would appear that in irrigation schemes in dry areas pests will be serious. It was proved necessary to cut out cotton at Ikowa because of very high pest incidence. Dwarf castor, simsim, green gram, chick pea and sorghum were badly damaged by various pests. Pigeon and guinea fowl caused serious damage immediately after sowing and hares grazed on beans, cowpeas and green gram.

Cotton

With the development of successful methods of controlling insect pests on cotton and earlier planting in the Eastern Province, it is now realized that bacterial blight may become an important factor in cotton production. The Empire Cotton Growing Corporation has posted an officer to the Research Centre at Ilonga to work on this problem and on the production of varieties suited to irrigation.

At Ukiriguru, the cotton breeding programme has been reorganized, leading to more efficient and economic handling of the material. Strains derived from Albar appear to be higher yielding than the UK issues, but these require further extended testing to substantiate present results.

Factors affecting the incidence of bacterial blight have been studied. It was found that the number of seeds per hole had a striking influence. In one comparison 8 per cent infection was recorded for one seed per hole and 62 per cent for six seeds per hole. Trash left lying on or near the surface of the soil is a source of infection, trash buried under the ridge does not give rise to infection.

Coffee

Progress is being made in studies to find suitable methods to reduce the harsh environmental conditions to which coffee is subjected in much of the Mbozi area. Windbreaks, boxing-in with bananas and tall grass and increased mulching are being tried. The provision of lime in the planting holes appears to be improving the growth of seedlings. Preliminary results suggest that monthly copper spraying is of value in reducing leaf fall during the early part of the dry season. The effect may not be so marked on older trees.

At Maruku, the programme covers a wide field for both Arabica and Robusta coffee. Planting in pure stands is being compared with intercropping with bananas, the value of fertilizers and manure is being compared, variety trials are in progress and an extensive study of various methods of rehabilitating old Robusta coffee has been started.

Cereal Crops

The work being done to find a variety of wheat with a high degree of resistance to stem rust is not meeting with success. Promising varieties in one season are badly attacked in the next season. A wide range of short-term maize varieties has been obtained and it appears that a reduction in the growth period of some 20-30 days compared with 130 days for Katumbili, at Mwanhala, is possible. The varieties are, however, rather susceptible to a fungus disease (*Helminthosporium*).

A number of varieties of rice are being compared for yield at Mahiwa, Mlali and Ikowa.



In Moshi District onions are becoming of increasing importance as a cash crop and in this photograph Mr. Sama Makombo is shown with some of the onions he harvested in 1959.



This photograph of an Mgogo in the Central Province is unusual because the crop he has harvested is rice. Good yields of this crop have been obtained at the Ikowa Irrigation Scheme where the photograph was taken.

Legume Crops

A collection of grain legumes of many types from many areas was planted at Ilonga. The results showed clearly that appreciable improvements in yield should be possible in a number of cases by straightforward selection.

The plant breeding programme on soya beans has now reached the stage of testing a large number of improved strains to determine those promising for extended field trials. There can be little doubt that the new types will be appreciably higher yielding than the current varieties. A variety of soya-bean obtained from S. Rhodesia appears to be more promising for high altitudes than the Nachingwea types.

Insecticidal experiments on beans for seed production showed that Endrex is effective, and cheaper than the standard DDT treatment and that appreciable increases in yield can be obtained. Seed treatment with Aldrin gave some control of bean-fly. The cause of "oily pod" of beans is still under investigation.

Oil Seeds

Progress in castor breeding has been disappointing. The damage to flowers and young capsules by sucking insects was very severe and could not be economically controlled by insecticides.

Work on sesame improvement is progressing satisfactorily. The variety Morada obtained from Venezuela appears to be a great improvement over the local types. The new sesame breeding programme is now well under way.

Pasture Research

A wide variety of grasses, edible canna and Russian comfrey have been under production tests for three years at Tengeru. Yields of *Sorghum almum* and Russian comfrey declined appreciably during this period. Elephant grass and *Setaria splendida* increased in yield in the second year but showed a reduction in the third year. The former is the most prolific and consistent fodder grass. Under the drier conditions at Oljoro Rhodes grass and *Panicum coloratum* have done best.

Programmes of pasture research were implemented on Ilonga and Ukiriguru.

Miscellaneous

Extensive series of experiments and observation plots of a wide range of crops were planted on sub-stations and local plots to study the local value of varieties, fertilizers and manures and to determine the best dates of planting.

Work on pests, diseases and the agronomy of pyrethrum is being increased.

An analysis of the annual yields of individual coconut palms at Chambezi suggests that there are cycles of production extending over a variable number of years. This, if correct, will complicate experimental work on this crop.

Trials of Aldrin, either mixed with fertilizer or used as a seed dressing, showed great promise for controlling termite damage to soya, maize and sunflower.

SECTION XV

NUTRITION

With the greater emphasis on the production of cash crops, there has arisen a danger of malnutrition increasing in certain areas. The main problem is to increase vegetable and animal proteins in the diet. Food consumption surveys have shown that purchase of dried fish is a big item in the expenditure of urban workers on a cash economy. Increasing demands for fish are in part being met by the introduction of technical improvements leading to greater productivity from the major fisheries. In areas which are still mainly on a subsistence economy there is a great interest in the development of minor fisheries which can be operated at subsistence level. In two such areas, Songea and the Central Province striking advances have been made, and details are recorded elsewhere in this report.

In Masasi and in parts of the West Lake Province, where the cattle population is low, officers have co-operated with the Veterinary Department to try to increase livestock numbers.

Maize is replacing sorghum and millets as a food crop all over the territory, but this is a retrograde step as far as nutrition is concerned. There was an increase in consumption of temperate vegetables, particularly in the Northern and Tanga Provinces, and also of fruit in many parts of the Territory. A number of hospital gardens have been renovated and outstanding progress has been made in Mbulu in this respect.

Officers of the Department have been co-operating with the Central Advisory Committee on Nutrition. The Fisheries Division has assisted the Committee in a campaign designed to popularize fish consumption. At the in-training course at Ukiriguru, lectures on nutrition were given.

SECTION XVI

LEGISLATION

The most important legislation affecting agriculture which was promulgated during the year was as follows:—

(a) *Rules*.—The Coffee Grading for Export (Bukoba, Karagwe and Kimwani) Rules 1959 were applied in respect of coffee exported from these areas and such coffee shall comply with the standard of one of the described grades and be packed in new bags.

The Cotton (Amendment) Rules published on 4th December, 1959, declared it to be an offence in the Lake, West Lake and Western Provinces to pack cotton in anything other than a square of cotton cloth.

(b) *Orders*.—The African Agricultural Products (Coffee) (Rungwe District) Order of 24th April, 1959, provided for the establishment of the Rungwe Native Coffee Board to control and regulate the production, cultivation and marketing of coffee grown and produced by Africans in the District.

(c) *Ordinances*.—An Ordinance to amend the Coffee Industry Ordinance.

(1) provided that a licence would be required for exporting coffee from the Territory whether or not the coffee was produced in the Territory.

(2) provided that the Coffee Licensing Authority may restrict exporter's licences to certain descriptions of coffee.

(3) provided for the exemption, from the restrictions on sale or purchases, the retail sale of coffee and all dealings in roasted coffee and its derivatives.

An Ordinance to "Provide For and Control the Milling, Marketing, Distribution, Import and Export and Sale of Wheat Flour and Wheatfeed" and to repeal the Wheat (Sale) Ordinance and the Milling Ordinance was passed by Legislative Council on 9th June, 1959.

SECTION XVII

BOARDS AND COMMITTEES

The following appointments were held by members of Headquarters staff:—

DIRECTOR

Chairman:

Lint and Seed Marketing Board.

Cotton Board.

Seeds Board.

Coffee Licensing Authority.

Member:

Tanganyika Agricultural Corporation Board.

Land Bank Board.

Tea Board.

Pyrethrum Board.

Coffee Board

Civil Service Advisory Board.
Maize Advisory Committee.
Central Advisory Committee on Nutrition.
Governing Body, Tea Research Institute of East Africa.
Agricultural Research Co-ordinating Committee (East Africa High Commission).
Animal Industry Co-ordinating Committee (East Africa High Commission).
Technical Co-ordinating Committee (East Africa High Commission) Marine Fisheries.
Roads Advisory Committee.
Dar es Salaam Chamber of Commerce.

DEPUTY DIRECTOR

Member:

International Red Locust Control Service.

FISHERIES OFFICER (Headquarters):

Member:

Lake Victoria Fisheries Board.

SECTION XVIII

STAFF

Mr. A. P. S. Forbes continued to direct the Department during 1959. Mr. M. Lunan was appointed as Deputy Director of Agriculture in the place vacated by Mr. L. J. S. Littlejohn in December 1958, and Mr. R. J. Spooner from Kenya joined the Department as Assistant Director of Agriculture in October 1959. Four Agricultural Officers, Messrs. Clegg, Mutter, Chambers and Winter, were promoted to Senior Agricultural Officer and the establishment of Assistant Directors of Agriculture was reduced from 4 to 3. Messrs. G. D. Scott and M. A. Owen, Agricultural Officers, were appointed as Pasture Research Officers. Six new Agricultural Officers joined in 1959, and Mr. I. S. Mkwawa, Assistant Agricultural Officer was promoted to Agricultural Officer (Tanganyika). Messrs. V. C. Allen and E. Hall, Field Officers were promoted to Senior Field Officer. Nine new Field Officers (Agriculture) joined in 1959 of whom 5 were ex-Makerere diplomates, 3 from overseas and one appointed locally. Two Agricultural Officers resigned from the Department and one did not renew his contract. Mr. F. P. H. Le Riche and Mr. D. R. A. Goode retired after 12 and 22 years service respectively. Two Field Officers left on completion of their contracts, one, (Mr. M. Yates) met with a fatal accident and two had their appointments terminated. Mr. C. M. Kapalaga, Assistant Agricultural Officer, left on transfer to Uganda.

On the Research side, Mr. H. J. van Rensburg who was acting as Senior Research Officer (Grade A) was confirmed in his appointment; Mr. G. W. Lock, Senior Research Officer, who had served on the Sisal Research Station for the last 12 years and who had completed 30 years of service, went on retirement and Mr. E. C. Diekmahns, Plant Physiologist, was promoted as Senior Research Officer (Grade B) in his place. Only two specialists joined the Department in 1959. They were Mr. D. A. Burdekin as Plant Pathologist and Mr. J. C. Warden as Chemist, on secondment from the Government Chemist's Department. Dr. Cole, Botanist at the Central Regional Research Centre, Ilonga, left on transfer to Nigeria.

In 1959, the Department suffered a great loss in the resignation of Mrs. K. M. Craufurd-Benson, Temporary Office Superintendent. Her tremendous grasp of Senior Staff matters acquired over a period of 8 years, was of great value to all concerned. Mr. C. Menezes joined the Department as a Junior Accounts Officer and Mr. S. K. Kushalappa was promoted to Office Assistant.

The number of Senior Field Assistant posts in the Department was increased by 9 making a total of 21; 7 Field Assistants were appointed to these new posts at the end of the year. Field Assistant posts in the Department were increased by 78 making a total establishment of 709 and the establishment of Subordinate Service instructors was reduced by 34. 14 Agricultural Instructors were promoted to Field Assistant.

Staff Position as at 31st December, 1959

Post	Establishment	Strength	Vacancies
Director of Agriculture	1	1	—
Deputy Director of Agriculture	1	1	—
Chief Research Officer	1	1	—
Assistant Director of Agriculture	3	3	—
Senior Research Officers (Grade A)	3	2	1
Senior Research Officers (Grade B)	3	3*	—
Senior Agricultural Officers	4	4	—
Agricultural Officers	57	54†	3
Fisheries Officers	4	3	1
Pasture Research Officers	3	3	—
Entomologist	4	4	—
Plant Pathologist	4	2	2
Botanists	4	4‡	—
Plant Physiologist	1	—	1
Horticulturist	1	1	—
Zoologist	1	1	—
Chemists... ..	7§	5	2
Assistant Chemists	2	—	2
Experimental Officers	4	2	2
Master (Seconded from Education Department)	1	1	—
Master	1	1	—
Instructress	1	1	—
Secretary	1	1	—
Treasury Accountant (Seconded from Accountant-General's Department)	1	1	—
Land Utilization Officer	1	1	—
Senior Field Officers (Agriculture)	13	13	—
Tobacco Officers	2	2	—
Coffee Grader	1	1	—
Inspector, Produce Inspection Service	1	—	1
Field Officers (Agriculture)	110	105¶	5
Assistant Agricultural Officers	12	10	2
Assistant Inspector, Produce Inspection Service	1	—	1
Research Assistant	1	1	—
Office Superintendent	1	—	1
Junior Accounts Officer	1	1	—
Office Assistants	4	4	—
Accounts Assistants	3	3	—
Warden	1	1	—
Stenographers/Personal Secretaries	7	6	1
Clerks Upper Division	30	28	2
Clerks (General Division/Subordinate Service)	119	113	6
Senior Field Assistants	21	17	4
Field Assistants	709	649	60
Agricultural Instructors (Subordinate Service)	1,282	1,272	10
Chemical Assistants	9	7	2
Coffee Grading Assistant	1	—	1
Medical Assistant	1	—	1
Artisans	5	3	2
Laboratory Assistants	7	3	4
Junior Laboratory Assistants	2	2	—
Laboratory Auxiliaries... ..	10	6	4
Motor and Tractor Drivers	2	2	—
Telephone Operator	1	1	—
Subordinate Service Staff	193	173	20
Fisheries Assistants	8	4	4
Fisheries Guards/Senior Fisheries Guards	31	17	14
Coffee Grading Auxiliaries	8	6	2
Junior Survey Assistants	30	30	—

*One Supernumerary.

†8 allocated but not yet arrived, 1 on leave pending completion of contract, 1 on leave pending termination of appointment.

‡One on leave pending resignation.

§Two on secondment from Government Chemist's Department.

||Two not yet arrived.

¶One on leave pending completion of contract.

SECTION XIX

POLICY

The Department has made during 1959 substantial progress in the implementation of its policy which is to guide, foster and stimulate an ever-increasing production both of foodstuffs and of cash crops, consistent with sound land use, in order to ensure the food supply of an expanding population and to enable improved standards of living to be attained.

Efforts are made to secure greater yields per man, per hour and per acre, rather than simply an increase in production by extended cultivation. Conservation of the soil and the maintenance and improvement of its fertility for the benefit of present and future generations are basic objectives; so also is the conservation of water.

The Department seeks to achieve these objectives through the medium of research, to ascertain the practices to be advocated and through an Extension Service to bring appropriate advice to farmers.

SECTION XX

CONCLUSION

I would like to record my appreciation of the loyal support I have received from all members of the Department, certain of whom have had to work under the most difficult conditions with little apparent reward for their untiring efforts. Thanks are also due to the Provincial and District Administration and other technical departments for their ready and whole-hearted co-operation in all fields of agricultural development. I am also indebted to members of the public who gave freely of their time to serve on boards and committees for the improvement of agriculture in the Territory.

A. P. S. FORBES,
Director of Agriculture

MONTHLY RAINFALL IN INCHES FOR SEASON 1955/59 AND YEAR 1959 AT PROVINCIAL STATIONS

	Morogoro Reg. No. 96.3700		Dodoma Reg. No. 96.3501		Tabora Reg. No. 95.3212		Mwanza Reg. No. 92.3209		Mbeya Reg. No. 95.3301		Arusha Reg. No. 93.3601		Tanga Reg. No. 95.3900		Mtwara Reg. No. 100.4004		Bukoba Reg. No. 91.3102	
	Average	Ins.	Average	Ins.	Average	Ins.	Average	Ins.	Average	Ins.	Average	Ins.	Average	Ins.	Average	Ins.	Average	Ins.
October, 1958	0.03	0.93	0.00	0.16	0.79	0.57	4.35	1.73	0.00	0.49	0.00	1.10	2.24	4.10	0.26	0.71	1.79	5.43
November, 1958	1.37	2.06	0.12	0.79	2.61	3.72	1.40	3.61	0.23	2.10	0.52	3.41	1.76	3.73	3.90	0.13	1.79	8.93
December, 1958	3.84	2.78	0.53	2.94	4.73	6.80	8.60	9.39	6.29	7.45	2.59	2.53	1.40	1.26	3.90	9.13	5.93	9.22
January, 1959	3.16	4.04	0.33	2.43	4.73	4.43	2.40	3.39	6.29	7.45	2.59	2.53	1.40	1.26	3.90	9.13	5.93	9.22
February, 1959	3.15	4.04	0.33	2.43	4.73	4.43	2.40	3.39	6.29	7.45	2.59	2.53	1.40	1.26	3.90	9.13	5.93	9.22
March, 1959	4.15	6.67	5.29	4.91	5.15	6.75	6.86	5.40	7.57	6.13	4.05	3.32	0.27	1.73	4.75	5.67	8.79	6.00
April, 1959	4.89	8.15	0.22	2.12	0.52	4.68	4.39	5.90	3.70	4.63	13.18	6.74	5.86	4.62	5.51	5.86	8.32	9.03
May, 1959	2.03	3.92	0.00	0.21	0.53	1.27	1.37	3.70	0.03	0.83	2.63	8.15	8.85	12.95	0.94	1.92	17.13	14.07
June, 1959	0.59	1.04	0.00	0.00	0.00	0.00	0.03	0.56	0.00	0.04	0.18	1.26	2.96	3.02	0.93	0.40	0.65	12.87
July, 1959	0.42	0.52	0.00	0.00	0.00	0.00	0.00	0.84	0.00	0.04	0.34	0.74	3.73	2.84	0.93	0.40	1.89	3.80
August, 1959	2.61	0.85	0.00	0.00	0.00	0.00	0.44	0.84	0.00	0.04	0.34	0.74	3.73	2.84	0.93	0.40	1.89	3.80
September, 1959	0.69	0.68	0.00	0.00	0.52	0.36	0.84	1.89	0.04	0.10	0.02	0.75	1.27	3.26	1.84	3.59	2.80	4.04
Total for season	27.20	38.88	23.45	22.39	24.52	34.55	31.90	36.89	30.60	33.88	33.84	47.23	51.82	52.59	30.50	44.53	73.53	80.87
October, 1959	1.45	0.91	1.26	0.16	1.39	0.52	5.26	2.02	2.70	0.48	1.88	1.34	2.57	4.09	1.06	0.91	4.00	5.93
November, 1959	0.95	2.04	1.21	0.78	8.54	1.54	5.71	3.48	2.37	0.63	2.99	0.45	0.84	4.97	0.63	1.27	4.96	9.93
December, 1959	3.48	2.80	5.19	4.03	4.98	6.60	3.16	6.73	7.37	5.35	6.13	3.99	0.86	3.22	20.89	8.66	7.09	7.53
Total for 1959	27.84	38.86	24.46	22.42	31.30	32.12	31.68	37.52	35.96	33.90	41.00	43.42	48.62	52.47	40.61	44.56	76.92	79.43

CROP PRODUCTION FIGURES

APPENDIX II

SISAL

Year				Production in tons
1955	...	...	...	176,499
1956	...	...	...	185,762
1957	...	...	...	184,877
1958	...	...	...	196,567
1959	...	...	...	205,273

COFFEE

Mild Coffee

Tons of clean coffee

Province	1955/56	1956/57	1957/58	1958/59
Northern	10,091	9,350	8,475	10,303
Southern Highlands	694	1,467	2,467	2,744
Southern	490	500	626	1,083
Tanga	304	300	515	513
Eastern	—	—	—	3
	11,579	11,617	12,083	14,646

Hard Coffee

Tons of clean coffee

Province	1955/56	1956/57	1957/58	1958/59
West Lake	—*	—*	—*	8,948
Eastern	331	400	255	265
Lake	9,144	10,200	9,040	55
Tanga	29	50	48	88
Western	—	—	35	67
	9,504	10,650	9,742	9,423

*Figures have previously been included in Lake Province production.

COTTON

Production in Bales of 400 lb.

Province	1955	1956	1957	1958	1959
Lake	108,843	121,304	151,322	151,608	182,623
Eastern	8,439	8,730	12,500	14,421	13,313
Tanga	1,814	2,275	2,245	2,518	2,307
Northern	2,834	1,244	2,212	1,947	2,135
Western	—	—	732	897	914
Southern	128	38	50	42	—
West Lake	—	—	—	—	316
	122,058	133,591	169,061	171,433	201,608

CASHEW NUTS

Tons of nuts sold through local markets

Province	1955	1956	1957	1958	1959
Southern	13,233	14,363	20,500	18,679	24,102
Tanga	—	—	—	—	20
Eastern	1,799	2,284	2,900	1,877	4,279
	15,032	16,647	23,400	20,556	28,401

CASSAVA

Tons sold through local markets

Province	1955	1956	1957	1958	1959
Southern	8,786	21,387	19,600	20,929	17,761
Western	5,935	9,648	4,600	5,888	6,180
Lake	10	100	1,100	1,624	2,750
Eastern	245	337	100	168	359
Tanga	—	—	—	56	—
Central	18	—	—	18	127
Southern Highlands ...	—	—	—	—	15
	14,994	31,472	25,400	28,679	27,192

COCONUTS

Tons of Copra

Province	1955	1956	1957	1958	1959
Eastern	4,955	4,204	4,000	5,423	5,218
Tanga	5,486	4,607	3,500	4,533	5,751
Southern	552	852	800	999	637
	10,993	9,663	8,300	10,955	11,606

MAIZE

Tons sold through local markets

Province	1955	1956	1957	1958	1959
Northern	36,041	26,000	20,000	26,500	22,000
Southern Highlands ...	25,766	7,250	5,200	15,282	13,865
Western	17,864	7,615	7,800	8,048	11,400
Eastern	20,069	6,560	7,300	6,000	7,355
Lake	5,740	3,687	4,300	5,178	5,289
Southern	2,670	3,990	5,500	3,007	5,273
Tanga	9,118	2,248	1,000	2,305	2,366
Central	3,322	2,650	600	1,394	2,575
West Lake	—*	—*	—*	—*	31
	120,590	60,000	51,700	67,714	70,154

* Have been included in Lake Province figures.

OIL SEEDS

(a) *Castor seed*

Tons sold through local markets

Province	1955	1956	1957	1958	1959
Central	7,870	12,012	13,894	3,030	3,207
Northern				1,700	1,615
Southern				1,114	847
Eastern				747	619
Southern Highlands ...				322	451
Lake	—	—	—	48	—
Western				12	30
Tanga				—	87
West Lake	—	—	—	—	58
	7,870	12,012	13,894	6,973	6,194

(b) *Cotton seed*

		Tons surplus		to seed requirement	
<i>Province</i>		1957		1958	1959
Lake		41,500	...	47,871	54,900
Eastern		3,900	...	4,593	4,100
Northern		500	...	1,450	650
Tanga		400	...	1,092	850
West Lake		—	...	—	50
Western		—	...	—	350
		46,300	...	55,006	60,900

(c) *Groundnuts*

		Tons sold through local markets				
<i>Province</i>		1955	1956	1957	1958	1959
Western		3,122	6,035	5,500	3,597	3,900
Central		550	2,096	2,700	3,268	7,725
Southern		3,985	4,158	3,200	1,575	3,406
Lake		827	2,081	2,500	937	677
Northern		—	211	500	200	60
Southern Highlands		79	79	200	129	140
Eastern		—	—	700	—	10
West Lake		—	—	—	—	9
		8,563	14,660	15,300	9,706	15,927

(d) *Sesame*

		Tons sold through local markets				
<i>Province</i>		1955	1956	1957	1958	1959
Southern		4,138	6,176	5,900	6,236	8,673
Eastern		299	558	400	556	812
Southern Highlands		—	—	—	151	345
Lake		36	65	100	63	178
Western		—	45	50	41	75
Central		43	50	50	1	77
		4,516	6,894	6,500	7,048	10,160

(e) *Sunflower*

		Tons sold through local markets				
<i>Province</i>		1955	1956	1957	1958	1959
Eastern		603	1,326	2,600	2,717	181
Western		5,311	3,482	4,000	2,516	2,200
Southern Highlands		289	701	1,000	1,099	988
Southern		539	738	2,500	1,024	480
Lake		2,423	886	1,000	737	143
Central		104	356	400	347	626
Northern		968	451	1,100	320	100
Tanga		109	17	50	87	17
		10,346	7,957	12,650	8,847	4,735

RICE

		Tons of paddy sold through local markets				
<i>Province</i>		1955	1956	1957	1958	1959
Lake		3,712	2,781	6,000	8,647	4,172
Southern Highlands		6,042	2,709	5,100	8,450	7,070
Eastern		14,172	2,319	8,300	5,864	7,078
Western		2,962	2,230	4,000	3,025	2,950
Tanga		2,783	2,436	3,000	2,467	6,513
Southern		2,276	1,835	1,400	1,271	2,279
Northern		84	51	50	160	260
Central		48	—	—	25	40
		32,079	14,361	27,850	29,909	30,362

PULSES

(Including yellow peas, chickpeas, soya, mixed beans, cowpeas, grams, pigeon peas, bambarra nuts)

Province	1955	1956	1957	1958	1959
Northern	1,398	4,147	1,600	3,640	6,189
Lake	4,472	2,299	3,500	3,099	965
Southern Highlands	1,064	2,208	1,600	2,077	2,690
Southern	2,700	2,794	4,000	1,672	1,763
Western	2,680	1,892	1,800	1,039	1,690
Tanga	618	276	800	624	600
Eastern	565	592	800	603	1,201
Central	73	106	100	49	—
West Lake	—	—	—	—	200
	13,570	14,314	14,200	12,803	15,298

PYRETHRUM

Tons of dried flowers

Province	1955	1956	1957	1958	1959
Northern	379	479	446	376	483
Southern Highlands	234	261	291	249	316
	613	740	737	625	799

SEED BEANS

Tons exported

Province	1954/55	1955/56	1956/57	1957/58	1958/59
Northern	2,110	2,549	1,247	3,420	3,885
Southern Highlands	—	—	—	—	3
	2,110	2,549	1,247	3,420	3,888

TEA

Manufactured, in lb.

Province	1955	1956	1957	1958	1959
Southern Highlands	3,303,666	3,520,893	3,993,407	4,122,245	5,202,810
Tanga	1,217,449	1,832,139	2,132,177	2,205,929	2,951,724
	4,521,115	5,353,032	6,125,584	6,328,174	8,154,534

TOBACCO

(a) *Flue-cured*

Cured leaf in lb.

Province	1955	1956	1957	1958	1959
Southern Highlands	2,909,890	2,738,283	2,735,000	2,748,480	3,589,488
Western	291,165	572,925	773,000	927,360	1,164,800
Southern	185,920	112,000	134,000	17,920	6,720
Lake	—	—	2,000	—	—
West Lake	—	—	—	—	8,960
	3,386,975	3,423,208	3,644,000	3,693,760	4,769,968

(b) *Fire-cured*

Cured leaf in lb.

Province	1955	1956	1957	1958	1959
Southern (Songea)	982,240	647,535	598,000	1,272,320	1,234,240
Eastern	—	—	—	389,760	201,008
West Lake (Nyamirembe)	361,312	545,720	473,000	85,120	92,960
	1,343,552	1,193,255	1,071,000	1,792,000	1,528,208

WATTLE

Tons bark sold through organized markets

Province		1957	1958	1959
		Production (Tons)	Production (Tons)	Production (Tons)
Tanga	...	1,050	1,417 (1,152 wet bark) (265 dry bark)	1,823 (1,413 wet bark) (410 dry bark)
Northern	...	300	167	229 (dry bark)
Southern Highlands	...	150	14	11,270 (dry bark)
Eastern	...	50	—	—
		<u>1,550</u>	<u>1,598</u>	<u>13,322</u>

WHEAT

Tons sold through organized markets

Province		1955	1956	1957	1958	1959
Northern	...	3,711	4,237	3,300	5,996	6,910
Southern	...	303	368	300	347	188
Southern Highlands	...	80	97	200	130	105
Western	...	28	68	50	59	60
Eastern	...	51	—	50	29	13
		<u>4,184</u>	<u>4,770</u>	<u>3,900</u>	<u>6,561</u>	<u>7,276</u>

SUGAR

Production in tons

Province		1955	1956	1957	1958	1959
Northern	...	10,415	18,025	18,400	21,133	26,791
West Lake	...	—	—	—	—	850
		<u>10,415</u>	<u>18,025</u>	<u>18,400</u>	<u>21,133</u>	<u>27,641</u>

ONIONS

Tons marketed

Province		1955	1956	1957	1958	1959
Northern	...	2,297	3,911	2,580	1,820	3,575
Central	...	160	272	300	268	1,982
Southern Highlands	...	195	201	210	211	220
Southern	...	16	22	10	22	40
Tanga	...	—	53	40	14	520
Lake	...	8	25	10	10	32
Western	...	17	21	20	6	5
Eastern	...	61	150	140	—	162
West Lake	...	—	—	—	—	5
		<u>2,754</u>	<u>4,655</u>	<u>3,310</u>	<u>2,351</u>	<u>6,541</u>

GUMS

Arabic and Copal in tons marketed

Province		1955	1956	1957	1958	1959
Western	...	426	285	150	235	460
Lake	...	402	158	150	129	925
Central	...	157	175	100	111	302
Southern	...	—	—	50	2	3
		<u>985</u>	<u>618</u>	<u>450</u>	<u>477</u>	<u>1,690</u>

KAPOK

Tons marketed

Province	1955	1956	1957	1958	1959
Eastern	216	941	1,200	732	655
Tanga	337	415	400	311	236
Southern	62	44	50	13	11
	<u>615</u>	<u>1,400</u>	<u>1,650</u>	<u>1,056</u>	<u>902</u>

OIL PALM

(a) *Palm oil in tons marketed*

Province	1955	1956	1957	1958	1959
Western	83	47	50	39	50
Tanga	40	40	30	—	30
	<u>123</u>	<u>87</u>	<u>80</u>	<u>39</u>	<u>80</u>

(b) *Kernels in tons marketed*

Province	1955	1956	1957	1958	1959
Western	370	351	350	378	450
Tanga	30	30	20	—	20
	<u>400</u>	<u>381</u>	<u>370</u>	<u>378</u>	<u>470</u>

EXPORTS FROM TANGANYIKA OF AGRICULTURAL PRODUCTS, 1955-1959 (TONS)

APPENDIX III

	Maximum Exports prior to 1959		1955 Amount	1956 Amount	1957 Amount	1958 Amount	1959 Amount	Export value, 1959
	Year	Tons	Tons	Tons	Tons	Tons	Tons	£
Sisal ...	1958	198,130	173,676	185,588	181,815	198,130	208,767	13,057,043
Cotton Lint ...	1958	30,229	20,374	27,890	28,311	30,229	30,704	6,657,295
Cotton Seed ...	1957	8,386	—	—	8,386	7,520	5,011	103,059
Cotton Seed Oil ...	1957	1,981	—	—	1,981	1,148	1,262	104,555
Coffee ...	1958	22,225	18,499	21,615	18,481	22,225	19,607	5,745,438
Beans and Pulses ...	1952	23,184	8,279	9,413	5,368	9,521	11,410	752,871
Beans, Soya ...	1957	1,483	567	913	1,483	696	1,045	39,063
Cashew Nuts ...	1957	33,651	18,202	16,741	33,651	31,310	33,209	1,561,987
Castor Seed ...	1958	17,858	7,870	12,012	13,894	17,858	14,195	616,419
Cassava ...	1956	24,000	2,486	24,000	20,051	17,777	13,690	218,994
Copra ...	1928	9,318	4,723	3,788	236	2,339	3,902	304,751
Groundnuts ...	1936	22,786	5,586	15,143	16,090	12,624	12,124	784,607
Gum Arabic ...	1950	2,319	2,125	1,542	684	503	1,843	159,721
Gum Copal ...	1950	110	70	45	40	13	12	906
Kapok ...	1957	905	872	717	905	862	857	79,950
Maize ...	1956	106,363	35,835	106,363	9,071	1,224	6,163	129,368
Millet and Sorghum ...	1955	13,150	13,150	5,084	899	2,563	1,797	42,731
Onions ...	1948	2,418	151	90	171	40	68	1,740
Palm Kernels ...	1954	674	386	472	454	662	898	46,494
Papain ...	1948	130	37	17	23	68	75	123,899
Pyrethrum ...	1945	697	275	307	292	613	544	113,528
Rice ...	1938	17,965	1,247	1,794	1,853	919	103	6,162
Sesame ...	1956	10,628	4,207	10,628	8,180	8,496	11,208	712,732
Sunflower Seed ...	1957	19,626	12,506	14,729	19,626	11,557	5,702	171,141
Tea ...	1958	2,239	1,689	1,979	2,176	2,339	2,687	770,609
Tobacco ...	1948	1,421	448	135	342	217	314	60,217
Vegetable Oils ...	1940	2,268	61	1,468	57	28	200	25,046
Wattle Bark ...	1955	4,837	4,837	3,178	1,525	865	1,341	25,565
Wattle Bark Extract ...	—	—	—	—	—	—	4,980	248,835
Other Oilseeds and Oil Nuts ...	1958	1,029	—	—	—	1,029	1,142	20,794
Essential Oils ...	1950	9	3	4	4	4	5	8,369
Total...	—	—	338,161	465,655	376,049	383,379	394,865	32,693,889

